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CONTENTS

Vol. 2, Nos. 1 & 2, 1989

Botanical exploration of the Canadian watershed of Lake Huron during the nineteenth century.

James S. Pringle 4 - 88

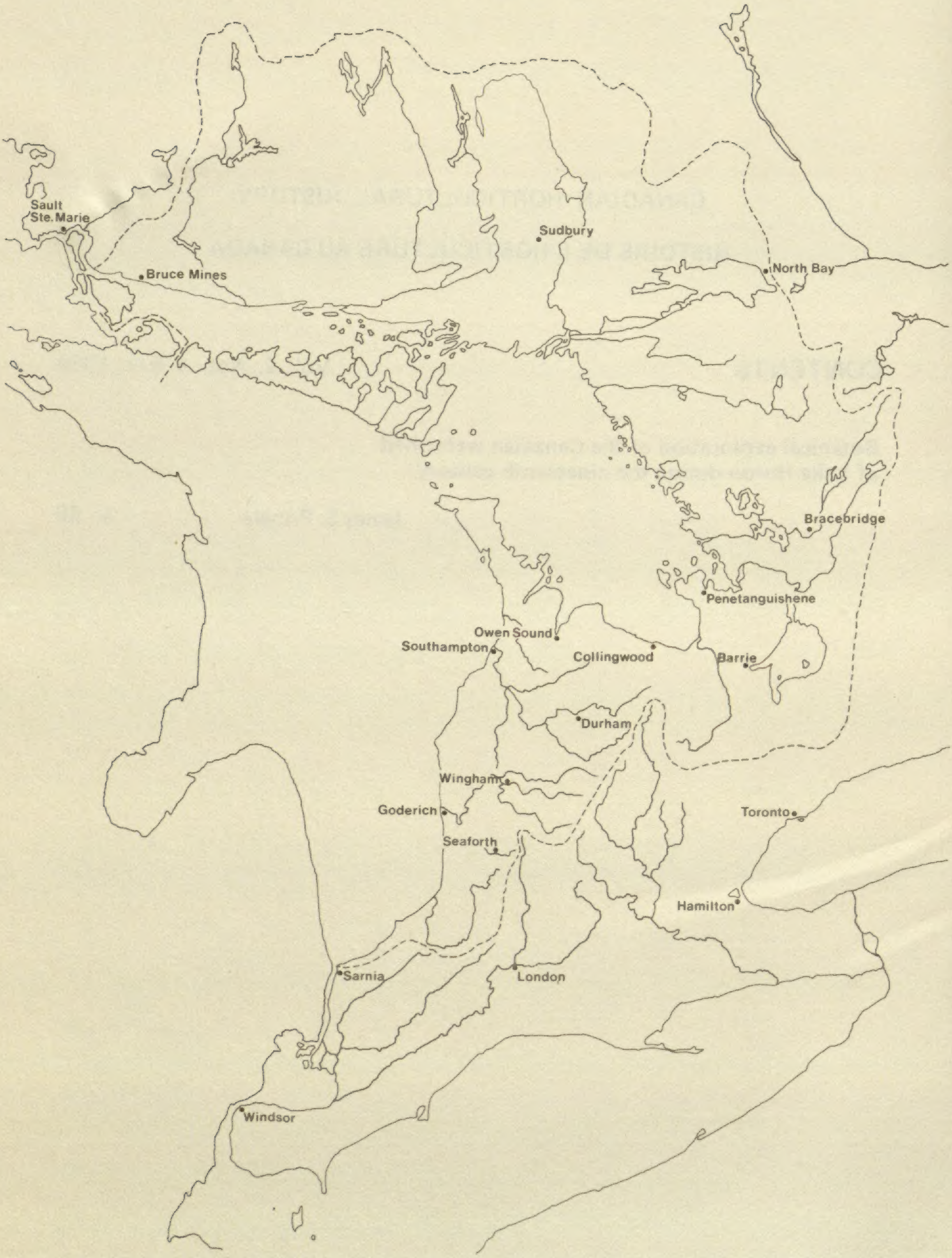

Fig. 1. Map of southern Ontario, showing the area covered by this study.

Canadian Horticultural History/Histoire de l'horticulture au Canada 1(1 & 2): 4-88, 1989

BOTANICAL EXPLORATION OF THE CANADIAN WATERSHED OF LAKE HURON DURING THE NINETEENTH CENTURY[1]

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Abstract

Early botanical exploration of the Lake Huron basin in Canada was mainly by British horticulturists, along with a few government appointees and travelers recruited by Sir William Jackson Hooker of Glasgow. After William Hincks joined the University of Toronto faculty in 1853, university biologists and their students became increasingly important in Canadian botanical exploration. From about 1860 to the end of the 19th century, the hobby of collecting plant specimens stimulated botanizing by resident amateur naturalists. The short-lived Botanical Society of Canada, founded by George Lawson, was especially important in this respect during the 1860s; later, a similar role was assumed by several local naturalists' clubs and academies of science. Foremost among the amateur collectors in the region were Jessie D. Roy of Owen Sound and Dr. T.J.W. Burgess of London and later of Hamilton. The greatest contributions to floristic exploration in the region during the 19th century were made by John Macoun of Alfred University and later of the Geological Survey of Canada.

Résumé

L'exploration précoce botanique du bassin du Lac Huron au Canada fut fait principalement par les horticulteurs anglais, ainsi que quelques appointés et voyageurs recrutés par Sir William Jackson Hooker de Glasgow. Après William Hincks a s'associé à la faculté de l'Université de Toronto en 1853, les biologistes et étudiants des universités sont devenus de plus en plus importants chez l'exploration botanique canadienne. Depuis environ 1860 jusqu'à la fin du 19eme siècle, le dada de collectioner les specimens des plantes encouragea botaniser pour les naturalistes amateurs de la règion. La Société botanique du Canada, qui ne dura pas longtemps, institué par George Lawson, fut particulièrement important dans ce regard pendant les années 1860es; plus tard, plusieurs groupes locaux de naturalistes et académies de science ont pris un rôle similaire. Plus important parmi les collectioneurs amateurs de la région furent Jessie D. Roy de Owen Sound et Dr. T.J.W. Burgess de London et plus tard de Hamilton. Les plus grandes contributions à l'exploration floristique dans la région pendant le 19eme siècle furent faites par John Macoun de Alfred University et plus tard de la Commission géologique du Canada.

Introduction

In *Botanical Beachcombers and Explorers*, a study of the history of botany, particularly floristics, in the Upper Great Lakes region, Voss (1978) presented "a few words about the east side of Lake Huron," but noted that "the Canadian basin of that lake deserves a fuller historical treatment." That fuller treatment is the purpose of this paper.

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[1]Contribution No. 65 from the Royal Botanical Gardens, Hamilton, Ontario.

Traduction de Caireen Brain.

Although Voss called for such a study, he commented that "The east shore of Lake Huron seems actually to have received little botanical attention in the 19th century." Unquestionably, the botanical exploration of the Canadian shore did lag behind that of the Michigan shore. The first known botanical collections from any part of this watershed were made in 1819, and not until 1825 (with one possible exception) was there any botanical exploration along the Canadian shore of Lake Huron itself. By this time, most of the distinctive shoreline species of the Upper Great Lakes (see Guire & Voss, 1963) had been discovered and published upon by Thomas Nuttall, who explored portions of the Michigan shore of Lake Huron in 1810, or even earlier by André Michaux, who encountered outlying populations of some of these species at Lake Mistassini in present-day Québec in 1792. Likewise, many of the prairie species that approach their eastern limits near Grand Bend or Point Edward had been described by Nuttall, Michaux, or John Leonard Riddell from United States material before these species were discovered in Canada. Nevertheless, there were a number of persons, many of them poorly known to botanical historians, who did make significant contributions to floristics in this region during the nineteenth century.

The geographic area covered in the present study is the Canadian watershed of Lake Huron, from the outlet of Lake George to the head of the St. Clair River (Fig. 1). Thus excluded are portions of Ontario visited by some well-known botanical explorers, namely David Douglas (1798-1834), who botanized around Amherstburg and along the Detroit and St. Clair rivers in 1823; Philip Whiteside Maclagan (1818-1892), who, as surgeon at Fort Malden, was in the same area in the 1840s;[2] Douglass Houghton (1809-1845), who obtained some specimens in the vicinity of Sault Ste. Marie in 1831; and Zina Pitcher (1797-1872), whose botanical explorations in the 1820s probably extended to the Ontario side of the St. Mary's River. (For references on these persons, see Desmond, 1977, and Voss, 1978.)

Mention is made of two explorers who probably sent horticultural material to Europe from this region in the seventeenth and eighteenth centuries, respectively, but otherwise the time period covered extends from the first known botanical collecting in this region in 1819 until the end of the nineteenth century. Folk classification of plants, of course, antedates this period, being as ancient as human occupation. Published observations of the vegetation date from the seventeenth and eighteenth centuries, in accounts of the voyages of explorers, missionaries, and traders. Devitt (1934) and Voss (1978) are among those who have reviewed some of this early literature. The present study, however, deals only with those persons who collected botanical specimens now in institutional herbaria and those who published works specifically on plant taxonomy and floristics. Local historians will realize that many important amateur naturalists are inevitably not mentioned — those who neither published papers nor preserved botanical specimens, but whose knowledge of the local flora was enthusiastically transmitted to others, doubtless including some of the individuals who are mentioned here.

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[2] References by Macoun (1883-1902) to Maclagan specimens from Owen Sound appear to represent confusion of Jones Falls just west of Owen Sound with Jones Falls in Leeds County, in which area Maclagan is known to have botanized.

This paper deals only with those who collected Embryophyta; no attempt has been made to investigate the history of collecting restricted to algae, fungi, or lichens.

A useful technique in determining who collected specimens pertinent to this study has been, when visiting herbaria, to examine specimens of some twenty or thirty species that are characteristic of unusual habitats in the Lake Huron basin but are uncommon or unknown elsewhere in Ontario. These habitats include the dune-panne complexes of the eastern shores of Lake Huron; the cliffs of the Bruce Peninsula and nearby islands; and acidic shores and oligotrophic lakes in the Muskoka and Parry Sound districts. As a result, only one or two specimens collected by several persons mentioned here have been seen. It should not be inferred, however, that only one or two specimens collected by such persons exist. The efforts of most of these naturalists presumably are represented by several to many more specimens, from the Lake Huron basin and often elsewhere as well, of more widely distributed species.

Names of persons known to have preserved botanical specimens from the area and period covered here are listed in the appendix, with years of birth and death, when known, and the present repositories of their specimens. Life spans for some persons mentioned incidentally follow their names in the text. Standard abbreviations for herbaria follow Holmgren et al. (1981).

Early exploration and collection for Hooker's Flora Boreali-Americana

Of the seventeenth-century missionaries, it is perhaps appropriate to mention here those of the Récollet order who established a mission near the present site of Lafontaine, Ontario, in 1623. The Récollets sent some ornamental plants from Québec to France, and there is circumstantial evidence, from consideration of the ranges of such species as *Monarda fistulosa* L., that one of them, probably Frère Gabriel Sagard (to which name he added the agnomen Théobat), was also responsible for the introduction of some species from the Penetanguishene Peninsula to European horticulture (Pringle, 1988).

There is one eighteenth-century botanical explorer who should be mentioned here because of the extent of his accomplishments, even though these did not include any definite contribution to the knowledge of the flora of the Lake Huron basin. This is Francis Masson (1741-1805), a native of Aberdeen, Scotland, who became an under-gardener at Kew in 1771, shortly before Joseph (later Sir Joseph, Bt.) Banks took over "the directing of botanical activities at Kew" (see Turrill, 1959, on this phase of Kew history). Banks "planned to grow in the botanic garden plants from all over the world," and to this end appointed Masson its first official collector. From 1772 through 1795 Masson sent plants to Kew from many parts of the world, most notably from South Africa, from which his most popular introductions included *Strelitzia reginae* Ait., the bird-of-paradise flower; species of *Gladiolus* and *Pelargonium*; and of greatest significance at least to British horticulture, the Cape heaths, South African *Erica* species.

Masson's next destination was Canada. This change from tropical and subtropical climates may not have been Banks's original plan for Masson; it appears, instead, that Masson's intended destination was the British West Indies, and that he went to Canada when it became obvious that piracy in the West Indies and war among the colonial powers would make his work there impossible. Masson arrived at Newark, Upper Canada [now Niagara-on-the-Lake] in May, 1798, and spent the summer in that area, going in the autumn to York [now Toronto] and Montréal, from which city he sent his first shipment of Canadian seeds to Banks, along with specimens of *Zizania aquatica* L. The following spring, by arrangement with the North West Company, Masson travelled via the Ottawa and Mattawa rivers and Lakes Nipissing and Huron to Lake Superior, as far as Grand Portage in present-day Minnesota. This was the site of an annual meeting between representatives from the Company's Montréal headquarters and traders from its widely scattered posts. Masson returned to Newark that autumn and then went to Kingston and Montréal. His shipment to Banks that year comprised two cases of living plants, including some aquatics, seeds of 123 species, and a quantity of herbarium specimens. Masson's health began to decline about this time, and the number of plants he sent to Banks dropped sharply, much to the latter's disappointment. At least part of the season of 1801 was evidently spent in Virginia. Banks apparently received little more from Masson, although as late as 1805, the year in which Masson retired and died in Montréal awaiting passage to England, he managed to obtain some plants from British stations around the Gulf of St. Lawrence and also some specimens of fruit, nut, and willow trees from Montréal. Masson is credited with having been the first to bring Canadian plants to the attention of Kew, and specifically with having introduced the white trillium, *Trillium grandiflorum* (Michx.) Salisb., to England.(Primarily from Jarrell, 1983, supplemented by material from Britten, 1884, and Coats, 1969.)

Masson's voyage of 1799 took him through a part of the area covered by the present paper, but whether he obtained any material for Kew on that portion of his journey is unknown. The rate of travel of the North West Company party may not have afforded Masson much time for botanical or horticultural collecting until he reached Grand Portage. His collections, whether of herbarium specimens, living plants, or seeds, were generally recorded simply as having come from "Canada," at least by their recipients in England (see Brunton, 1985, for a description of a representative label ex BM). Masson named no new species of Canadian plants himself, and published nothing on his experiences in Canada, but possibly some of the plants he sent from Canada were the progenitors of the types of names based on plants cultivated at Kew.

Any study of botanical history in present-day Canada prior to 1841 inevitably centres around Sir William Jackson Hooker's (1829-1840) *Flora Boreali-Americana*. The title page of this flora indicates that it was originally envisioned, at least by the Colonial Secretary who commissioned it, to be an account of the botanical discoveries by Franklin's Second Land Expedition (infra), as a companion volume to the zoological record of the expedition, entitled *Fauna Boreali-Americana*, concurrently being prepared by John Richardson (infra). Hooker, however, was a proponent of floras for all parts of the British Empire, and was particularly interested in the flora of British North America (Hooker, 1825). He had, moreover, recently completed botanical appendices to Captain (later Rear Admiral Sir) William Edward Parry's narratives of three of his expeditions to arctic North America, and he had access to specimens collected in North America by David Douglas on behalf of the

Horticultural Society of London. Hooker therefore expanded the scope of the *Flora Boreali-Americana*, making it a flora of British North America.

When writing the *Flora Boreali-Americana*, Hooker was Regius Professor of Botany at the University of Glasgow. (He became Director of the Royal Botanic Gardens, Kew, in 1841.) Hooker's own travels were somewhat limited – he never did visit North America – but he sought out persons who were travelling to various parts of the Empire, among them government appointees, diplomats, and naval officers, asking that they collect specimens for his floristic studies and recruit able and enthusiastic residents in the lands they visited. Several such persons had already contributed specimens from British North America before Hooker was commissioned to prepare the botanical accounts of the Parry and Franklin expeditions.

The *Flora Boreali-Americana* was the first major flora to concentrate on and to deal with all of British North America, and the only one to cover all of present-day Canada until the publication of John Macoun's (1883-1902) *Catalogue of Canadian Plants*. The lasting importance of the *Flora Boreali-Americana* conferred a special significance to botanical history upon the many conscientiously acknowledged persons who provided specimens for it. (For citations of many publications on Hooker, see Desmond, 1977, and Stafleu & Cowan, 1979.)

The first botanical collector in the eastern watershed of Lake Huron, with the possible exception of Masson, noted above, appears to have been John Goldie, from Ayrshire, Scotland, who traveled to North America in 1819 in quest of both herbarium specimens and horticultural material. Goldie had studied under Hooker at the botanical garden in Glasgow, and those specimens that Goldie was able to ship back to Scotland became part of Hooker's herbarium. There are several biographical publications on Goldie (listed by Ewan, 1968), and his journal of his North American travels has been published (Spawn, 1967), providing information on his itinerary and collecting localities. Most of Goldie's time was spent in Lower Canada, in the Lower Great Lakes region, and in the United States; only the period from 27 June to 5 July 1819 was spent in the region being considered here. At this time he explored the territory around the southern end of Lake Simcoe from a base of operations at "the upper landing place" on the Holland River [ca. 2.4 km NNW of the present community of Holland Landing] (Goldie, in Spawn, 1967). Although the period spent here was brief, this was, according to Reznicek (1980), "clearly ... one of the highlights of Goldie's summer travels."

In this area, Goldie discovered a remarkable complex of dry prairies and savannahs, fens, and *Larix* swamp forest, a portion of which was observed by Reznicek (1980) still to exist in 1976 much as it had in 1819. Here Goldie recorded seeing some prairie species, such as *Euphorbia corollata* L. and *Asclepias tuberosa* L., that are uncommon and highly localized in that part of Ontario. Goldie also found two rare[3] calciphytes then new to science, viz., *Ranunculus rhomboideus* Goldie, from open, dry, sandy sites, and *Drosera linearis* Goldie, from fens (named and described by Goldie, 1822). A third specimen from this locality typified the name *Caprifolium pubescens* Goldie, but it was soon realized that the species so named had been described four years earlier as *Lonicera hirsuta* A. Eaton.

[3]Species are referred to as "rare" or more specifically as "provincially rare" or "nationally rare" in this paper on the basis of their being listed as such by Argus & White (1977).

In 1825, Captain (later Sir and, posthumously, Rear Admiral) John Franklin and the other officers of his Second Land Expedition to the Polar Sea visited the Naval Establishment at Penetanguishene, en route from New York to the Arctic via York [Toronto], Lake Simcoe, Georgian Bay and Lake Superior. The surgeon-naturalist on this expedition was Dr. (later Sir) John Richardson, who had already established a reputation in botany, having collected plant specimens in boreal and arctic British North America under extremely difficult circumstances on Franklin's first Polar Sea Expedition and having written the botanical appendix to Franklin's *Narrative* of that expedition. Richardson subsequently continued to distinguish himself in botanical exploration, collecting additional specimens from the Arctic on this second expedition and later as leader of an expedition searching for Franklin, after the latter's tragic last expedition. Richardson also collected animal specimens, and, as noted above, was the principal author of the *Fauna Boreali-Americana*, an account of the animal species seen and collected on the Second Land Expedition. Other members of Franklin's Second Land Expedition included Lieutenant (later Captain Sir) George Back (1796-1878), who, on this expedition, collected plants along the Arctic coast, and who later led expeditions of his own; and Lieutenant Edward Nicholas Kendall (1800-1845), who subsequently provided Hooker with specimens from New Brunswick. Thomas Drummond was also a member of the Franklin party, as assistant naturalist, although he was to separate from the main party at Cumberland House, in present-day Saskatchewan, to explore the Rocky Mountains. Drummond was at that time about to begin his activities as one of the most important early botanical explorers in the interior of western British North America and later in Texas (Franklin, 1828; for biographical information on the officers of the expedition, see Stafleu & Cowan, 1976; Desmond, 1977, and references therein; Porsild & Cody, 1980; and, on Kendall, Harper, 1970).

The Franklin party passed through Upper Canada in April 1825. The first botanical specimens collected, as would be expected so early in the season, were mosses, including *Fontinalis dalecarlica* B.S.G., from "a rivulet at Holland Landing," and *Dichelyma capillaceum* (With.) Myr. from nearby trees (Kindberg & Macoun, in Macoun, 1883-1902). Some of Drummond's other moss specimens from Upper Canada, without specific locality data, were probably also collected at this time, including some of the nomenclatural types cited by Ireland & Ley (1984).

Spring, however, was early in 1825, and by the time they reached the Willow Creek (western) end of the portage from Lake Simcoe to the Nottawasaga River, Richardson and Drummond found and collected a few plants already in flower on 12 April (Franklin, in his journal, MS 248/280/1-2, Scott Polar Research Institute). The party left Penetanguishene 23 April 1825, as soon as the ice conditions permitted travel by canoe. Nevertheless, before leaving, they were able to collect the early-flowering *Dentaria laciniata* Muhl. *Ranunculus rhomboideus* Goldie (as *R. brevicaulis* Hook. in the *Flora*), from the "shores of Lake Huron," presumably was also obtained at Penetanguishene, since it is unlikely that suitable habitats for this early-flowering species were encountered farther north along Georgian Bay. After Richardson and Drummond left Penetanguishene, it is unlikely that they collected plant specimens elsewhere along the shores of Lake Huron, in part because of the season. Also, with their mission being the exploration of the Arctic, they wanted to move north and west as rapidly as possible, rather than spend their limited summer time exploring Upper Canada. This they did, arriving at Sault Ste. Marie on 1 May 1825.

There are only a few other collections from "Canada" by Richardson and Drummond cited in the *Flora Boreali-Americana*. These specimens, representing species flowering in midsummer or later, such as *Nymphaea odorata* Ait. and *Brasenia schreberi* S.G. Gmel. (as *Hydropeltis purpurea* Michx.), or collected with ripe fruits, must have been obtained on the return voyage in 1827. In view of the rapid pace, the flowering times of the plants, and the restricted use of the name "Canada" in Franklin's *Narrative,* it is probable that all or most of these specimens were collected well down the Ottawa River, or in the more relaxed circumstances after the party arrived at Lachine.

While at Penetanguishene, Richardson met the medical officer of the Naval Establishment, Clement Charles Todd. Todd had been based at the naval hospital in Kingston during the latter part of the War of 1812-1814 and immediately thereafter, and had served aboard H.M.S. *Confiance* in the Battle of Lake Champlain. He had subsequently spent two years at the Naval Establishment at the mouth of the Grand River (Port Maitland), before being assigned to Penetanguishene in 1819 (Wood, 1926; Anonymous, 1981; Pringle, 1986-1988). Todd, who was described by Bayfield (H.W. Bayfield in epist. to J.W. Croker, 25 May 1828, Public Archives of Canada Adm. 1/1576) as "a good botanist and mineralogist ... also a good geometrician," had recorded meteorological and phenological observations at Penetanguishene over the years; these records were subsequently adapted for publication (Todd, 1828) by Richardson. Also, using Pursh's *Flora Americae Septentrionalis* for identification, Todd had already collected a modest number of botanical specimens. One can readily imagine Todd's delight at the arrival of a scientific party at this small and isolated outpost, where he and a lieutenant were the only officers. Richardson told Todd about Hooker's projected flora of British America and of his interest in obtaining specimens from Upper Canada for this purpose, and encouraged Todd to collect plants more extensively in 1825 and 1826 (Pringle, 1986-1988).

The specimens provided by Todd, representing 204 taxa according to the citations in the *Flora Boreali-Americana*, constituted Hooker's largest source of material from Upper Canada.[4] These taxa, by their distribution, indicate that Todd explored much of present-day Simcoe County, and possibly regions beyond, in search of plants of different habitats. Among his collections are some species of restricted distribution, notably such species as *Parnassia glauca* Raf. (as *P. caroliniana* Michx. in the *Flora*), *Hypericum kalmianum* L., and *Satureja arkansana* (Nutt.) Briq. (as *Micromeria glabella* (Michx.) Benth.), which grow in the dune-panne complexes along the shore of much of the Penetanguishene Peninsula (see maps by Guire & Voss, 1963). Of particular interest in this category was a specimen called *Linum virginianum* L. by Hooker, but later designated the holotype of the name *L. medium* (Planch.) Britt. *Linum medium*, if circumscribed so as to comprise only the allotetraploid populations, is Ontario's only known endemic vascular-plant species.[5] Other uncommon species collected

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[4]Although bryophytes were not dealt with in the *Flora Boreali-Americana*, Todd also sent some mosses to Hooker, as indicated in citations by Macoun & Kindberg (in Macoun, 1883-1902, 6:83, 197).

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[5]Old records from the vicinity of Lake Erie, including one from Pennsylvania, were noted by Dugal (1984), but plants from the Lake Erie area were previously found to be diploids by Harris (1968; also C.M. Rogers, pers. comm. ca. 1969), and were included in var. *texanum* (Planch.) Fern. with the comment that this taxon might better be recognized as a distinct species.

by Todd include psammophytes, such as *Spiranthes lacera* Raf. (as *S. gracilis* Bigelow) and *Silene antirrhina* L., that were probably found in the open pine woods on outwash plains or glacial-lake terraces. Historically significant specimens represented several naturalized species, including the first record of the now-abundant *Hesperis matronalis* L. from North America.

Nomenclaturally significant specimens collected by Todd included, in addition to the type of the name *Linum medium*, syntypes of the names *Hypericum elipticum* Hook. and *Gentiana andrewsii* Griseb., still in use, respectively, for a species of St. John's-wort and the most widely distributed species of the bottle gentians; and a syntype of the name *Spiranthes decipiens* Hook., the lectotype of the name *Arabis confinis* S. Wats., and the holotype of the name *Ribes huronense* Rhdb., names now relegated, respectively, to taxonomic synonymy under *Goodyera oblongifolia* Raf., *Arabis drummondii* A. Gray, and *Ribes cynosbati* L. (Todd's specimens are discussed further in Pringle, 1986-1988).

By the 1830s, ornamental trees and shrubs introduced from North America by William Bartram, John Fraser, John Goldie, Francis Masson, and others had been propagated to the extent that they had aroused great interest among British nurserymen and their clientele. Among these nurserymen was Robert Brown, a partner in the Perth, Scotland, nursery of Dickson & Brown (subsequently Dickson & Turnbull). Brown is best known in horticultural history for his selections of burnet roses (*Rosa pimpinellifolia* L.) that became the ancestors of many popular rose cultivars (Rowley, 1961, and quotations from Sabine therein; Paterson, 1983), and as having been one of the early mentors of David Douglas. Upon his retirement in 1834, Brown joined with James McNab (a.k.a. Macnab) in an expedition to North America. James McNab was the son of William McNab, who in 1834 was Curator of the Royal Botanic Garden, Edinburgh. Later, James McNab himself became Curator of the Royal Botanic Garden, after having served as Curator of the Garden of the Royal Caledonian Horticultural Society, which was adjacent to and is now part of the Royal Botanic Garden. The period of James McNab's administration at the Royal Botanic Garden was one of remarkable progress, which included considerable expansion of the facilities and the development of several new gardens and collections. McNab is also noted for his talents as a botanical illustrator. (On both Brown and McNab, see Desmond, 1977, and references cited therein; on McNab, see especially Fletcher & Brown, 1970).

In North America, Brown and McNab hoped "to see the perfection to which North American plant species attain in their native soils," thus to "be better able to judge the degree of perfection to which they are capable of being brought by cultivation" (Macnab [sic], 1835a). From New York they traveled via the Hudson River and Lake Champlain to Montréal, and via the St. Lawrence River and Lake Ontario, with stops at Kingston and Toronto, to Fort Niagara,

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[6] Although, at least in Canada, the orthography "McNab" is sometimes considered to be a solecism, Dr. E. Charles Nelson (in epist., 1987), who has made extensive studies of this family of botanists, has determined that although neither William nor James was consistent in the spelling of his surname, "McNab" was "the commonest form" employed by them, and was "consistently used" by James McNab by the mid-1800s, e.g. as stamped on his herbarium sheets. It appears, however, that James McNab often used the form "Macnab" in earlier years, since this was the form used in the two papers by him cited here and was also used by Hooker.

New York. From Fort Niagara they went to Niagara Falls, where they began their overland journey through Upper Canada. Thence they traveled to Hamilton, Brantford, near which they found some notable prairie species, and London, and entered the Lake Huron watershed near the present site of Lucan, en route from London to Goderich. (This portion of their route was covered very uncomfortably, in farm wagons; the notorious "Black Donnellys" had not yet begun their London-Exeter stage service.) Along they passed through continuous forest, much of it dominated by huge elms, many of them 1-2.5 m in diameter (Macnab [sic], 1835b).

McNab and Brown arrived in Goderich in late August, 1834. According to McNab (1835a), "With the exception of one of the New Jersey swamps, the portion of [North America] from which [they] reaped the greatest harvest of botanical rarities was the neighbourhood of Goderich in Upper Canada." In this area, McNab (1835b) recorded seeing white pine and hemlock trees of great size, and logs of these species with 300-400 annual rings. He also noted seeing "very large sugar maples, with splendid specimens of the black and white ash, limes [=basswood], oaks, beeches, birches, cherries," and, along the Maitland River, planetrees 1.75-3 m in diameter. Elms ca. 1.5 m in diameter were found to be about 300 years old, and the larger oaks about 200 years. Other trees that formed "extensive tracts" in the area were balsam poplar and larch, with white spruce occurring along the Lake Huron shore. McNab and Brown collected not only herbarium specimens of species then in flower, but also plants and seeds of earlier-flowering species, to be grown and identified in Scotland. From Goderich they traveled by boat southward on Lake Huron, noting the tall white pines along the shore, thence via the St. Clair River and Lake Erie to Cleveland, overland to Pittsburgh and Philadelphia, and ultimately to New Jersey, where McNab made a number of historically significant collections in the Pine Barrens. The herbarium specimens that McNab obtained on this expedition were made available to Hooker in time for citation in parts 8-12 of the *Flora Boreali-Americana*.

Three taxa new to science were discovered by McNab and Brown in the area covered by the present paper (Nelson & Dore, 1987), and were named by McNab (1835a) upon his return to Scotland. The first was the white-petalled form of the cardinal flower, now (Pringle, 1988a) known as *Lobelia cardinalis* L. forma *alba* (McNab) St. John, encountered along the Goderich Road just north of the present site of Exeter. By the estuary of the Maitland River at Goderich, McNab discovered a new species of valerian that he named *Patrinia longifolia*. The species is still accepted as distinct, but the epithet *longifolia* could not legitimately be transferred to *Valeriana*, so the species is now known by the later name *Valeriana edulis* Nutt. ex T.&G., with the subspecies found at Goderich being called ssp. *ciliata* (T.&G.) E. Meyer. The gentian named *Gentiana barbata* Froel. [var.] *β browniana* Hook. ex McNab, for McNab's companion on this expedition, is now usually recognized at the rank of species, as *Gentianopsis virgata* (Raf.) Holub (*Gentiana procera* Holm). Other notable collections included some aquatic plants and several of the characteristic species of the dune-panne complexes, e.g. *Zigadenus glaucus* (Nutt.) Nutt. (reported as *Z. chloranthus* Richardson), *Cacalia plantaginea* (Raf.) Shinners (as *C. tuberosa* Nutt.; first report for Canada), and *Prenanthes racemosa* Michx.

The Hooker - Macoun interval: beginnings of botanical exploration by Canadians

The completion of Hooker's *Flora Boreali-Americana* removed a major impetus for botanical collecting in British North America. After the journey of McNab and Brown, there appears to have been a hiatus of about 23 years in the botanical exploration of the Canadian basin of Lake Huron.

It was during this interval — in 1848 — that some members of Jean Louis Rodolphe Agassiz's well-known expedition to Lake Superior, including Agassiz (1807-1873) himself and James Elliot Cabot (1821-1903), who wrote the narrative of the expedition (in Agassiz, 1850), returned via Bruce Mines, Sturgeon Bay (near Victoria Harbour), Lake Simcoe, and Toronto. (En route to Lake Superior, this expedition had sailed from Detroit, with no stops at Canadian ports on Lake Huron.) On Lake Superior, numerous plant specimens had been collected, mostly by Charles Greely Loring, Jr. (1828-1902), brother-in-law of Asa Gray; these constituted the basis for a phytogeographic discourse by Agassiz (1850). On the return voyage, however, the party had split up at Sault Ste. Marie, and the specimens had been crated there for shipment to Harvard. Some observations on the vegetation between Sturgeon Bay and Orillia were recorded, but there is no indication that any botanical specimens were collected on this part of the journey.

The first person who did collect botanical specimens in the vicinity of Lake Huron, Canada West, after 1834 was apparently Rev. William Hincks, the first professor of natural history at the University of Toronto. Hincks was a native of Cork, Ireland, who, prior to coming to Toronto in 1853, had taught at Manchester College in York, England, served as a Unitarian clergyman, and been professor of natural history at the university in Cork. He was known not only as a scientist but also as an advocate of liberal causes, including shorter working hours and the abolition of slavery and capital punishment. In Canada, his diverse interests continued to be represented in his publications, the topics of which encompassed botany, zoology, psychology, and economics. However, despite Hincks's liberal views noted above, McKillop (1982) cited him as an exemplar, during his latter years on the faculty, of the "old guard, ... British in both training and outlook," who resisted proponents of more Canadian representation on the faculties of Ontario universities, and also noted his anti-Darwinian sentiments. It was alleged, doubtless with justification, that Hincks had been chosen for his position at the University of Toronto because he was the brother of Francis Hincks, Premier of the United Province of Canada, whereas Thomas Henry Huxley had been more highly recommended by his academic peers. Nevertheless, Hincks's appointment was not without considerable benefit to natural history, and in particular to botany, in Canada West. During his 18 years at Toronto, according to Scadding (1872), he "preserved a great number of the plants of the country and obtained from friends a good many British plants and a small collection from the United States." These specimens became the necleus of the University of Toronto herbarium.[7,8] At least three other plant collectors mentioned in this study, namely John Gibson, J.M. Buchan, and H.B. Spotton (infra), were students in arts at University College, University of Toronto, while Hincks was on the faculty, and presumably their interests in botany were stimulated by him. T.J.W. Burgess, as a student in medicine rather than in arts, was probably not in Hincks's classes, but he was no doubt acquainted with Hincks through their membership in Toronto's newly formed Unitarian congregation. (On Hincks, see Scadding, 1892; Wilson, 1972; Desmond, 1977; Forward, 1977; and Hewett, 1978).

Most of Hincks's botanical collections were made in the Toronto area, but he traveled extensively in southern Canada West in his studies of the flora (note localities mentioned by Hincks, 1864).[9] Of greatest interest in the present context is his 1857 visit to Owen Sound, where he made the first discovery of two rare ferns, *Phyllitis scolopendrium* (L.) Newm. var. *americanum* Fern., the hart's-tongue fern, and *Polystichum lonchitis* (L.) Roth, the holly fern, at any of their now-famous Ontario localities (Hincks, 1864; Lawson, 1864; Watt, 1865; Soper, 1954). Hincks made further collections of ferns at Owen Sound in 1859 and 1868; the specimens from the latter excursion were widely distributed, with the recipients including David A.P. Watt (infra) in Canada and Michael Schuck Bebb, John Howard Redfield, and others in the United States.

The next naturalist to botanize in the area discussed here was a resident of Michigan, Edward Payson Austin, who had studied at the University of Michigan from 1857 to 1859 but who had not received a degree. Upon leaving the University, Austin was employed as an engineer by the United States Lake Survey (on which see Voss, 1978, and references therein) in surveys of the Upper Great Lakes until 1863. His chief contribution to botanical exploration in the Great Lakes region was a quantity of specimens collected in the vicinity of Fort Gratiot [now Port Huron, Michigan] in 1860, from localities on both sides of the border. Of particular interest is a specimen of the nationally rare orchid *Apectrum hyemale* (Muhl.) Torr., found at Ipperwash 3 June 1860 (A. A. Reznicek, in epist., 1986). During the 1870s, Austin was employed by the Office of the Nautical Almanac in Washington, D.C., and by the U.S. War Department Engineers, with whom he made astronomical observations for a survey of the boundary of Nebraska. He remained interested in botany for a time, but later devoted his avocational attention primarily to entomology, in particular to the collection and study of beetles, on which he published a number of papers. In 1874, Austin joined the staff of the observatory at Harvard University and was also one of the founding members of the Cambridge Entomological Club, although, contrary to a statement by Jones (ms. quoted by Lenz, 1986), he was never editor or "owner" of the Club's journal, *Psyche*. He also conducted a "Natural History Agency" (advertised in *Psyche*), selling entomologists' supplies and sets of insect specimens, and apparently also some plant specimens that he collected in Massachusetts.

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[7] Some specimens had previously been collected by Henry Holmes Croft (1820-1883), who had come to Toronto as professor of chemistry and experimental philosophy when the university (then the University of King's College) began operations in 1843. These specimens were incorporated into the university herbarium by Hincks.

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[8] Two Hinckses of Toronto collected plant specimens now in TRT. Soper's (1954) and Boivin's (1980) references to "(C.) W. Hincks" apparently resulted, at least in the first instance, from the misreading of the handwritten "Gul.," an abbreviated Latinization of "William," as "C.W." Confusion of Rev. William Hincks with Dr. Clarence Meredith Hincks, who graduated from the University of Toronto Medical School in 1907, may also have been involved. Such confusion is presumably responsible for Lanjouw & Stafleu's (1957) statement that Clarence Meredith Hincks collected in Ontario from 1837 to 1861, dates incompatible with the biographical data presented by McKay (in Wallace, 1978; see also Barnhart, 1965), in which C.M. Hincks' life-span is given as 1885-1964.

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[9] Hincks planned to write a flora of Canada (in the pre-Confederation sense), but this project was never completed.

Although Austin's contributions to botany were modest, a complete account of his life would have been very much of interest, because there are indications that it might especially well illustrate the impact of the professionalization of biology upon amateur naturalists in the 1880s. His announcement of a trip to Arizona in 1881, "primarily on business, but collaterally with attention to the insects to be found" (Mann & Trelease, 1881), indicates that he had begun a transition to a new career before leaving Cambridge. A decline in the submission of manuscripts for *Psyche* and in attendance at meetings indicate problems in the Cambridge Entomological Club about that time, and the news columns of *Psyche* made no mention of the departure of a member of the executive from Cambridge in 1882.

Austin went to Salt Lake City, Utah, where he became an assayer. His prolific authorship of entomological papers ceased abruptly, but he continued to indicate an interest in Coleoptera in information sent to *The Naturalists' Directory* for another thirteen years (Cassino, 1898), and the writings of Samuel Hubbard Scudder indicate that Austin maintained contact with that prominent entomologist at least until ca. 1890. As an assayer, Austin was employed in 1891 by Marcus Eugene Jones, a geologist and mining engineer who became best known for his botanical collections and his publications on the flora of the western United States (Lenz, 1986). Jones's writings contain no mention of botanical activities with Austin.

Cassino (1898) last received data for *The Naturalists' Directory* from Austin in 1895. It was probably about this time that Austin returned to Massachusetts. As of 1903, he was living in Somerville and was a member of the Boston Society of Natural History (Allen, 1903). The following year he was not so listed; as far as the secretary was aware, however, he had not died, so he may merely have chosen not to renew his membership. No other information on Austin in Somerville has been encountered, despite searches kindly conducted by George K. Hart and Pamela B. Colt of the staff of the New England and Somerville History Collection, the Public Library of the City of Somerville. They reported that no Austin with his initials was listed in the 1907 city directories. Assuming that the B.S.N.H. membership list is correct, it may be, of course, that Austin came to Somerville after information for the 1903 directory had been compiled and died or moved prior to 1907. His name is absent from the general and obituary indices to the *Somerville Journal* (G.K. Hart & P.B. Colt, in epist., 1988). (Information on Austin, where not otherwise indicated, is from Mann, 1874, and Voss, 1978.)

The aforementioned events in Upper Canada (Canada West after 1841) illustrate the contrast between the botanical history of Ontario and that of the United States (see also Berger, 1983, pp. 18-24, and Cody et al., 1986, pp. 2-5). During the period from 1815 to 1850, even the sparsely populated "western" frontier states and territories saw extensive botanical exploration and publication by resident naturalists such as Daniel Drake, Douglass Houghton, Edwin James, Increase Allen Lapham, Thomas Gibson Lea, John Leonard Riddell, and Charles Wilkins Short, all of whom were American-born and educated. Prevented by a history of two wars from continued identification with the British cultural institutions, the United States had quickly founded its own; there were at least three universities and colleges in Kentucky and two in Tennessee before the end of the eighteenth century, and others in Ohio and Michigan by 1820. Canada West, in contrast, had no functioning universities until 1841. The early universities of Canada West were, moreover, "not founded in

order to advance the state of knowledge ...[but] to promote the cause of denominational religion" (McKillop, 1982), which orientation, along with their small size and slow growth for several decades, long delayed the representation of the natural sciences in their curricula. An attempt by Charles Fothergill of Toronto to found the Literary and Philosophical Society of Upper Canada was dismissed by the powerful Anglican Archdeacon (later Bishop) John Strachan with the comment that "such a society would scarcely be required in Upper Canada for another hundred years." Fothergill's proposals for a botanical garden, provincial museum, and other cultural institutions likewise came to naught (Baillie, 1944). All of the major botanical collectors in Upper Canada cited by Hooker – Douglas, Drummond, Goldie, Maclagan, McNab, Richardson, and Todd – were only temporarily in North America; they returned to their homes in Britain, and there, also, went the specimens they had collected.[10]

Gradual changes resulted from the growing population of Upper Canada and the formation of the United Province of Canada in 1841. The accompanying increase in Canadian autonomy and responsible government resulted in more of the positions that required formal education and afforded adequate leisure time for botanical avocations being held by Canadians rather than by appointees sent to Canada from the United Kingdom. Hincks was the first of the professional natural scientists discussed here to have been based at a Canadian educational institution, although he had received his education and established his reputation in Ireland. The role of Canadians in education and science increased further following Confederation in 1867, which permitted the development of a national cultural identity and the establishment of federally supported research institutions.

The first botanical collector in the Lake Huron basin to have been born and educated in Canada was Robert Bell, called "one of Canada's leading explorers" by Voss (1978). Bell, in 1860, was a staff member of the Geological Survey of Canada and also an engineering student at McGill University. The previous summer, he had led a geological party exploring the north shore of Lake Huron, and had traced the Silurian outcrops along the Niagara Escarpment from Owen Sound to Niagara Falls. From 10 September to 6 October 1860, after having explored portions of both the Canadian and Michigan shores of Lake Superior, Bell proceeded to Lake Huron, where he continued his geological studies and also collected plants on St. Joseph and Pallideau islands, at Bruce Mines, around the mouths of the Thessalon and Mississagi rivers and on nearby islands, on Great Cloche and Manitoulin islands, and finally at Owen Sound. Bell (1861) published a list of the plants collected, among which were some of the characteristic alvar species of the islands, including the nationally rare *Astragalus neglectus* (T.&G.) Sheldon (as *A. cooperi* A Gray). Identification of the plants was credited to Braddish Billings, Jr. (1819-1871), an amateur botanist of Prescott (shortly thereafter of Ottawa; on Billings, see Dore, 1962, 1968).

Bell received his C.E. degree from McGill in 1861, and entered full-time employment with the Geological Survey. His activities during the next few years included a study of geological formations west of the Escarpment, from Haldimand to Bruce County, in 1861, and a survey of Manitoulin Island in 1865. Apparently he did little botanizing on these occasions, although, according to Hincks (1864), he collected *Phyllitis scolopendrium* at Owen Sound in 1861.

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[10]Goldie eventually did return to Canada, where he spent the last 42 years of his life, but he did little in botany during this period.

From 1863 to 1867, Bell served as interim professor of chemistry and natural history at Queen's University, following the resignation of George Lawson (infra), although he continued his work for the Geological Survey during the summer. In 1866, he undertook another survey expedition to northern Lake Huron, accompanied by his brother, John Bell, who had just received the degree of M.D. from McGill (on John Bell, see Anonymous, 1878, 1879). On this expedition, John Bell did the botanical collecting and published the account of the plants seen (J. Bell, 1870). Before proceeding to the islands, the Bells spent several days at Owen Sound, where John Bell obtained a number of specimens, including several rare ferns. The Bells left Owen Sound in mid-July and proceeded to Cape Smith, Wikwemikong Bay, Little Current, and Gore Bay on Manitoulin Island, and Whiskey [now William] Island immediately to the east; thence to Mississagi Island in the North Channel and Bruce Mines on the mainland; to St. Joseph Island, where Bell botanized at Hilton Beach, Richardson Point, Hay Point, and several other localities to Little Cockburn and Cockburn islands, the latter being extensively explored, with specimens being collected at Thompson Point, Sand Bay, McLeod's Harbour, Point Huronia, and other localities on the coast and in the interior; to Drummond Island, Michigan; and back to Owen Sound with additional stops on most of the islands visited earlier. John Bell (1870) listed 428 species of vascular plants, identified by Asa Gray, plus five bryophytes and four lichens from this expedition. Among these were the first record of the nationally rare *Solidago ohioensis* Riddell for Canada, from Cockburn Island; several other species uncommon in that part of the Great Lakes region, including *Ceanothus herbaceus* Raf. (*C. ovatus* Desf., misapplied) and *Pterospora andromedea* Nutt. from Manitoulin Island; and some weeds, such as *Agrostemma githago* L. from Richardson Point, St. Joseph's Island, and other naturalized species, such as *Ranunculus repens* L. from Gore Bay, Manitoulin Island, for which records from 1866 are of historical interest (Morton & Venn, 1984). Between Sault Ste. Marie and Blind River, the next significant botanical exploration was by a University of Michigan expedition in 1932, on which Carl Otto Grassl and Walter Norman Koelz were the chief botanists, and by Norman Carter Fassett the same year. As recently as 1983, the area along the North Channel of Lake Huron was noted by Riley as being "generally poorly represented by collections in herbaria." Likewise, Manitoulin Island was not well explored botanically until many years after the Bells' visits (Soper, 1963; Morton & Venn, 1984). Therefore, the Bells' specimens, which bear remarkably precise locality data for their time, remain especially significant.

John Bell died in 1878, but Robert Bell's later career included numerous expeditions to Newfoundland and Labrador, northern Ontario, and the Northwest Territories, on which he collected large numbers of botanical specimens, the first from some of the regions he explored. He also found time to study medicine, in order to serve the people in the remote areas he visited, and received his medical degree from McGill in 1878. He prepared the Sudbury and French River topographic maps in 1888 through 1892, and did further surveys of the north shore of Lake Huron in 1894. (Ami, 1927; Voss, 1978, q.v. for citations of other papers on Bell.)

George Lawson (1827-1895), now called "the father of Canadian botany," arrived at Queen's College (now Queen's University) in Kingston in 1858, as professor of chemistry and natural history. Lawson had previously been keeper of the herbarium and demonstrator in botany in his alma mater, the University of Edinburgh. Boivin (1981) has observed that "Lawson's appointment was remarkable in many ways: he already had a bibliography of 52 published papers,

one of which is about plant distribution in Canada; he was part of the new breed of Ph.D.'s trained in Germany [University of Giessen, 1857]; and he was a layman in a confessional university which had previously only appointed churchmen as professors." (On Lawson, see Anonymous, 1969, and Boivin, 1981.)

Of greatest significance in the present context was Lawson's founding of the Botanical Society of Canada in December 1860. Although the Society met only in Kingston and the majority of its regular members ("Fellows") lived in the Kingston area, there were other members throughout much of Canada West and parts of Canada East. Honorary and corresponding memberships were bestowed on botanists in more distant parts of North America and in Europe. Consequently, the Society's herbarium acquired specimens from diverse regions. Also, doubtless in part because of its Presbyterian affiliation, Queen's College attracted students from various parts of Canada West, and they, too, were encouraged by Lawson to collect botanical specimens.

Among the specimens that presumably were contributed to the herbarium of the Botanical Society of Canada are the earliest known from the Muskoka District, collected by William Tytler in 1863.[11] Tytler had graduated the previous year from the University of Toronto, where he had been involved in the founding of the fledgling university's library. In 1863, he became headmaster of a school in Carleton Place; later, he held similar positions at schools in Smith's Falls, St. Mary's, and finally, in 1875, at the Guelph Collegiate Institute, where he spent the remainder of his career (Rose, 1886; alumni records, University of Toronto). The Muskoka District, being underlain by the granitic rocks of the Canadian Shield, is of interest floristically for western range extensions of species associated with acid soils and oligotrophic lakes. However, the two Tytler collections encountered in this study, *Utricularia cornuta* Michx. and *U. resupinata* B.D. Greene ex Bigelow, from "Muskoka Lake" and "Muskoka Bay," respectively, are not restricted to such habitats, at least the former frequently occurring in marly sites. Acid-soil species might be found through a further search for Tytler specimens at QK.

Examination of specimens at QK of species likely to have been collected in the Lake Huron basin also disclosed *Parnassia glauca* Raf. (present identification) from the "bank of a small tributary of the Saugeen, Durham," collected by Charles Cameron in 1862. From geographical considerations, it is highly probable that this was the Rev. Charles James Cameron, who was at that time the Presbyterian minister of several churches in the Durham-Markdale area, including those at Rocky Saugeen and Priceville. Cameron, a native of Invernesshire, Scotland, came to Canada in 1856 and straightway began his studies for the ministry at Knox College, Toronto. He served his first charge from 1861 to 1876, then accepted a less arduous pastorate at Moose Creek in Stormont County. In 1879, in the interests of Mrs. Cameron's health, he returned to the Lake Huron area, for a year at Cotswold, near Harriston, then at Armow, near Kincardine, where he remained until his retirement in 1888 (Cameron, 1901). His limited botanical collecting seems to have been inspired in some way by the existence of the Botanical Society; no specimens from his years at Armow have been encountered.

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[11] Since Tytler was neither a Fellow of the Botanical Society nor a student at Queen's, it seems likely that his specimens were sent to Lawson, shortly before Lawson's departure from Kingston, by a Fellow of the Society in Toronto, probably William Hincks. Lawson did not mention Tytler among his sources, nor cite his specimens, in his manuscript flora of Canada, prepared while at Dalhousie (W.G. Dore, in epist., 1984).

Lawson left Queen's suddenly in the autumn of 1863, evidently in protest against incompetence and corruption in the administration (Boivin, 1981), and became a faculty member at the newly reopened Dalhousie University in Halifax and concurrently at the Halifax Medical College. Later, he became Secretary of Agriculture for Nova Scotia (Anonymous, 1969). As noted above, Robert Bell succeeded Lawson as "interim professor" at Queen's, but Bell's primary interests were in geology and cartography, and his primary responsibility was probably to the Geological Survey of Canada. Bell left Queen's in 1867; 13 years passed before the plant sciences were again represented in the curriculum, and even then they were taught by a professor whose professional education had been for the Presbyterian ministry.

The Botanical Society of Canada did not long survive in the absence of Lawson's leadership. The Kingston Botanical Society may have been a "rump groups" that carried on for a few months, but it, too, soon passed out of existence. (The only evidence of its having existed encountered in this study was entry no. 259 in Adams, 1928-1930). Lawson took his own herbarium with him to Nova Scotia, but the herbarium of the Botanical Society of Canada evidently remained in Kingston. Its subsequent history is obscure. Although specimens now at QK were evidently once part of the Society's herbarium, James Fowler was aware of no herbarium on the campus when he joined the Queen's faculty in 1880 (Beschel, 1966; Crowder, 1974). Although it might be suggested that Fowler merely considered the herbarium not to be university property, Macoun, who had doubtless been aware of the herbarium's existence earlier, did not cite significant specimens from this herbarium in his *Catalogue*, indicating that its whereabouts was indeed unknown in the 1880s.

Alexander Ferrie Kemp was a native of West Greenock, Scotland, and received his academic and theological degrees from the University of Edinburgh and Presbyterian College in London, respectively. After serving for five years as a chaplain to troops in Bermuda, Kemp came to Montréal in 1855 as pastor of St. Gabriel Street Presbyterian Church, "the mother church of Scottish Presbyterianism in Canada." From 1866 to 1870, he was a pastor in Windsor. Then, during a turbulent period in the history of his denomination in Canada, he, along with a number of other Presbyterian clergymen, found it expedient to seek employment elsewhere. After teaching philosophy at Olivet College in Michigan and Knox College in Illinois, he returned to Canada in 1874 as principal of the Brantford Young Ladies' College. He was principal of Ottawa Ladies' College from 1878 until his retirement to Hamilton in 1883 (Anonymous, 1884; McDougall, 1982). While in Montréal and later while in Ottawa, Kemp published several works on marine and fresh-water algae. His sizeable herbarium of vascular plants, now at QK, was accumulated over a long period and included specimens from many localities in Ontario and Québec, including Saugeen [now Southampton] in 1865.

Before concluding this discussion of events in the 1860s, it is appropriate to depart from the sequence of Canadian botanists to note the activities of two naturalists from the United States. Henry David Thoreau (1817-1862) should be mentioned because of the fame of the man, although it is unlikely that he collected plants in the area being considered here. Voss (1978) has provided a brief account of the travels of Thoreau and Horace Mann, Jr. (1844-1868; later an instructor in botany at Harvard College and author of several works on the flora of Hawaii), in which they arrived (from Mackinac Island, Michigan) at Goderich on 4 July 1861 and proceeded by train across Canada West to Ogdens-

burg, New York, and thence to Concord, Massachusetts, which they reached on 10 July. Thoreau's deteriorating health limited the quantity and quality of the notes, botanical and otherwise, that he made on this trip, and he spent little time outside the train on the Canadian portion. However, according to Voss (1978), Thoreau did note a boraginaceous plant unknown to him, believed by Voss to have been *Cynoglossum boreale* Fern., in Canada West as well as in the United States.

John Muir, who became one of the United States' most famous nature-writers and conservationists, entered Canada West at Sault Ste. Marie on 1 March 1864, and gradually made his way eastward, collecting a few plant specimens, as the season permitted, on St. Joseph's Island, Manitoulin Island, and the Bruce Peninsula, and on to Simcoe County, where herbarium data indicate that he collected plants on 20 April. During the summer of that year, Muir explored and botanized in various parts of Canada West, as far south as Niagara Falls. In September, he joined one of his brothers, Daniel Muir, Jr., who had come to Canada earlier and was employed at Meaford. Daniel Muir returned to the United States in May 1865, but John remained at Meaford, where he was employed in a woodworking factory, and collected many plants in that area in 1865. Some of these specimens from 1864-1865 were sent by Muir to his parents' home in Wisconsin and are now at MO, but the majority were destroyed in a fire at the factory in early spring, 1866, after which Muir went to Indianapolis. A few references to plants from Muir's reminiscences of this period have been published. According to Wolfe (in W.S. Fox, 1952, p. 137), Muir later "recalled the two supreme moments of his life. One was when he found *Calpyso* blooming alone in a Canadian swamp. The other was his meeting with [Ralph Waldo] Emerson." (On this period in Muir's life, see W.S. Fox, 1952, and S.R. Fox, 1981; for lists of other biographical material, see Stafleu & Cowan, 1981, and Ewan & Ewan, 1981).

The Macoun era

John Macoun's (1883-1902) *Catalogue of Canadian Plants* succeeded Hooker's *Flora Boreali-Americana* as the standard reference on the occurrence and distribution of plants in Canada (as presently bounded). Like Hooker's *Flora,* Macoun's *Catalogue* was a monumental work, representing thoroughgoing research by an individual of great ability, energy, and enthusiasm, and, similarly, its status confers historical importance upon the botanical collectors cited therein.[12] Unlike Hooker's *Flora*, however, Macoun's *Catalogue* was written by a Canadian resident, and it represents his own extraordinarily extensive field work as well as that of others.

From 1871 to 1901, John Macoun was himself one of the most important plant collectors in the Lake Huron basin, sometimes accompanied by other naturalists. In general, there is ample biographical material on Macoun, includ-

[12]When a distribution record in the *Catalogue* is attributed to a person other than Macoun himself, there is usually no distinction in the format between records based on specimens seen by Macoun and those based on publications. If the person was one who sent specimens to the herbarium of McGill University, to that of the Geological and Natural History Survey of Canada (now CAN), or to Macoun, and/or to have resided in Ottawa, Macoun's citations are generally of specimens examined. Otherwise, the citations are generally based on published reports.

ing his autobiography (J. Macoun, 1922; see also Anonymous, 1880; W.T. Macoun, 1921; MacKay, 1922; and publications listed by Ewan & Ewan, 1981, and by Stafleu & Cowan, 1981). However, except for a brief reference to his first trip to Owen Sound in 1871, Macoun's autobiography includes no mention of his trips to the Lake Huron area, and his own accounts of plants collected, along with other authors' citations of his herbarium specimens, are the only published records.

From his arrival in Canada from Ireland in 1850 until 1868, Macoun worked as a farmhand and salesclerk, and, after graduating from the Toronto Normal School, as a schoolteacher at Castleton and later at Belleville. During this time he studied the natural sciences, especially botany, largely independently, but with valuable assistance and encouragement from many correspondents, including Hooker, Hincks, and Robert Bell.

Following the establishment of the Botanical Society of Canada (supra) based in Kingston, ca. 85 km from Belleville, Macoun's participation enabled him to gain recognition in botany among the natural scientists of Ontario. Consequently, when Albert College in Belleville attained university status in 1868, Macoun was offered a professorship in botany, which post he held while continuing to serve as a head master in the Belleville school system. In 1875, he became a full-time Albert University staff member, occupying the chair of natural history as well as being rector of the College Grammar School. During his latter years on the faculty, Macoun was frequently on leave in order to participate in the government-sponsored expeditions to western Canada that dominate his autobiography. In 1879, he resigned from the Albert faculty to devote full time to such activities, and, in 1882, he was given a permanent appointment as Naturalist in the Geological Survey of Canada.

In 1868, Macoun had been the botanist on a privately organized expedition from Lindsay to the headwaters of the Trent River, but, although the party was said to have gone as far as the "Muskoka Lakes" (Macoun, 1922, p. 42), Macoun's collecting on this occasion was probably confined to the Lake Ontario watershed. The farthest point from Lindsay from which any specimens from this trip have been seen in the present study is Boshkung Lake (spelled "Bushkong" by Macoun) north of Minden. (Just west of Boshkung Lake, the Bobcaygeon Road intersected the Peterson Road near the height-of-land between the Lake Huron and Lake Ontario watersheds. The latter road would have provided access to Muskoka, but there is no indication that Macoun obtained any specimens along it. Note also the records for *Potamogeton* and *Juncus* in Macoun's *Catalgoue*, since these genera were especially prominent among the specimens from the 1868 expedition.) Also, Macoun had sailed from Collingwood on his 1869 expedition to Lake Superior, but it is unlikely that he collected any specimens there.

In 1871, Macoun received an invitation to visit Owen Sound as a guest of Mr. & Mrs. William Roy. He eagerly accepted this invitation, already having heard of the rare plant species in the Owen Sound area from Hincks and Bell.

The Roys lived at Royston Park, a farm of ca. 75 ha occupying Lots 10 and 11, Concession III, Sarawak Township, just north of the present city limits of Owen Sound (McLeod, 1973; Croft, 1980). William Roy (1808-1895) was a prominent member of the Fruit-Growers' Association of Ontario, and the

Annual Reports of the Association note the quantity, quality, and diversity of the apples, grapes, pears, plums, and peaches produced at Royston Park (see especially Burnet, 1875, who also noted the "many varieties of flowering shrubs and rare plants, flourishing luxuriantly" at Royston Park in 1874). It was Mrs. Roy, however, who was the field botanist and who introduced Macoun to the rare plants of the area, although Macoun was careful to record that "Mr. Roy called himself our man Friday and carried a basket" on their botanical excursions. This visit was an especially enjoyable experience for Macoun, who "for the first time [had] communion with a botanist day after day" (Macoun, 1922).

Mrs. Roy, née Jessie Dalrymple Gregg,[13] was a native of Ireland, but was of Scottish ancestry and had grown up in Aberdeen. She and Mr. Roy had lived for a time in Montréal and Brantford, but she does not appear to have been active in botany until some time after they moved to Owen Sound in 1863. Evidently, however, she did have a good educational background. Following a meeting of the Fruit-Growers' Association of Ontario at Owen Sound in 1874, the Association's president (Burnet, 1875) paid tribute to Mrs. Roy as "a correspondent with the learned and scientific in foreign lands, – one generally up in physics and especially skilled in botany and fruits – one whose knowledge in art is only equalled by her modest and womanly character."

It is likely that Mrs. Roy became interested in botany, or specifically in the preparation and exchange of herbarium specimens, through meeting Coe Finch Austin, one of the foremost American bryologists of the time, while visiting her brother, William Gregg (spelling evidently later altered to Greig), superintendent of an emporium in Lodi, New Jersey. Austin lived at Closter, ca. 13 km from Lodi, taught school there and at nearby Demarest, and was a popular lecturer at the Englewood Institute, ca. 8 km from both Closter and Lodi (Demarest, 1918). This would explain why Austin, who included specimens contributed by Mrs. Roy in sets of exsiccatae, entitled *Musci Appalachiani*, distributed in 1870, received specimens from Mrs. Roy earlier, apparently, than any of her other botanical correspondents. (On Austin's exsiccatae, see Sayre, 1971, and Crowder, 1974.) Austin was well acquainted, through correspondence and exchanges, with numerous bryologists and other botanists in North America and Europe. Presumably it was he who told Mrs. Roy that James Fowler (then a clergyman in New Brunswick, but already active in botany), Lawson, and Macoun would welcome correspondence and specimens from Owen Sound, and who first advised her on contacting botanists in the United States and Europe. (Biographical data on Mrs. Roy have been gleaned from census records, Sarawak Township, 1881[14] [microprint, Archives of Ontario]; Mrs. Roy's death certificate [Monroe County Department of Health], Rochester, New York]; her will [G.S. Ont. 1-861, Surrogate Ct., Grey Co., microprint, Archives of Ontario]; and an obituary of Mr. Roy [Anonymous, 1895]. A brief article [p. 2] and a standard death notice [p. 1] in *The Owen Sound Advertiser*, vol. XXVII, no. 12; whole no. 1364, March 21, 1889, contain no further data. Material graciously sent by librarians in Lodi and nearby Passaic provided some information on William Gregg, but nothing pertaining to his and Mrs. Roy's family background or childhood environment.)

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[13]The former Miss Elliott from Brantford referred to by Croft (1980) was the second Mrs. Roy, whom Mr. Roy married in 1890.

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[14]Mrs. Roy's occupation is listed as "botanist" in this census record.

Mrs. Roy, as indicated by Macoun (1922), had already done considerable botanizing in the Owen Sound area prior to Macoun's visit, specializing in ferns and mosses. In 1866 (or possibly 1868), she had discovered *Dryopteris filix-mas* (L.) Schott, the male fern, the first record of this species for Canada (Lawson, 1889). Another interesting discovery, although in this case it was not identified until 1968, was *D. filix-mas* X *D. marginalis* (L.) A. Gray (specimen at F, originally identified as *D. filix-mas*). Other rare ferns that Mrs. Roy had found and was able to show Macoun included *Polystichum lonchitis* (L.) Roth, *Asplenium viride* Hudson, *Phyllitis scolopendrium* (L.) Newm. var. *americana* Fern., and *Cryptogramma stelleri* (Gmel.) Prantl.

Specimens collected by Macoun and Mrs. Roy in 1871 date from 22 July through early August. The majority came from Royston Park, Inglis Falls, and elsewhere in the immediate vicinity of the town of Owen Sound. They also explored the Escarpment in the vicinity of Jones Falls at Springmount, and at the mouth of Indian Creek and various other points along the west shore of Owen Sound north of the town. On the Bruce Peninsula, they went to Colpoy's Bay, and continued northwest across the peninsula to Red Bay, where Macoun first beheld the dune-panne complexes of the Peninsula's west coast. His brief introduction to these communities evidently stimulated a desire to study them further; Red Bay was a major collecting site on his 1874 expedition (infra).[15] Reflecting Mrs. Roy's interests, the 1871 collections included many mosses and ferns, as well as flowering plants. A set of the mosses was sent to Prof. Thomas Potts James, of Harvard University, who, in collaboration with Charles Léo Lesquereux, was working on the *Manual of the Mosses of North America*. Prof. Sereno Watson, also of Harvard, received a set of the vascular-plant specimens (Rodgers, 1944).

Mrs. Roy continued to collect botanical specimens on her own during the 1870s and early 1880s. Most of her botanizing was done in the immediate vicinity of Owen Sound, although one may sometimes wonder if as many specimens actually came from Royston Park itself as the printed labels indicate. Royston Park was, however, definitely the habitat of some rare fern species, as indicated, for example, by the more detailed data for *Dryopteris filix-mas* (as *Aspidium filix-mas* (L.) Swartz) recorded by Burgess (in Macoun, 1883-1902). Moreover, other labels of Mrs. Roy's do indicate a concern for locality data.[16] In Ontario, the most distant point from Owen Sound at which Mrs. Roy botanized, except for Niagara Falls, was evidently Manitoulin Island, which

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[15] In the vicinity of Red Bay and Howdenvale, dune-panne complexes such as those visited by Macoun, with many of the rare species he encountered in 1871 and 1874, are preserved in the Petrel Point Nature Reserve (Federation of Ontario Naturalists) and the St. Jean Point Nature Preserve (Sauble Valley Conservation Authority).

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[16] Another factor besides lack of concern for locality data may have contributed to errors or loss of detail in labeling during the late nineteenth century. The post office, at least in Canada, interpreted labels as correspondence, which should be sent separately from specimens, as first-class mail. This presumably seldom created problems with domestic mail, but when specimens were subject to customs inspection, the discovery of labels among them might result in substantial postal charges being levied against the recipient, depending on the mood of the authorities present (indicated in Mrs. Roy's letter to M.S. Bebb, 15 March 1872).

she visited in 1878, although in 1873 she had brought back some specimens from Scotland and Switzerland, among them a moss that she had scraped from the gravestone of Pierre Abélard.

Mrs. Roy's botanical activities were curtailed in 1876 by a hip dislocation, suffered when she was thrown from a sleigh. Although apparently she never fully recovered, she was able to resume some botanizing the following year. Further problems ensued, however, and in 1880, after two years of "very poor" health, she spent the summer at Peaks Island, a health resort of Portland, Maine, but nevertheless she collected marine algae there. She remained mentally alert at that time, eager to continue the development of her herbarium. Her last days, however, were spent as a patient in the sanitarium at Rochester, New York.

George Lawson, who in 1869 was at Dalhousie University, was one of the first botanists other than Austin to receive specimens from Mrs. Roy. Other Canadian recipients included James Fowler, David A.P. Watt (infra), and T.J.W. Burgess (infra), to whom Mrs. Roy sent what may have been her last collections, specimens of the hart's-tongue and male ferns dated 1 October 1883. Of special interest to historians are specimens given by Mrs. Roy to Catharine Parr Strickland Traill (1802-1899) of Lakefield, one of Canada's best-known nature-writers. According to Boivin (1980), "one or two" of these specimens are extant in a notebook of specimens, now at TRT, that had been presented by Mrs. Traill to her granddaughter.

Mrs. Roy also exchanged specimens with many owners of private herbaria in the United States, with whom she communicated as a result of being listed in S.E. Cassino's *The Naturalists' Directory* and in the "Botanical Directory" published in the *Bulletin of the Torrey Botanical Club*. Letters from Mrs. Roy to Michael Schuck Bebb, a noted authority on *Salix,* and to Elihu Hall (these letters now in the archives of the Field Museum of Natural History; copies of six graciously provided for this study by Roberta C. Becker) indicate the extent of her botanical correspondence and the size and scope of her herbarium. These letters, along with labels at F, GH, MO, and MTMG, show that those in the United States with whom Mrs. Roy exchanged specimens included, in addition to Austin, Bebb, Hall, and James, Henry Nicholas Bolander, Townshend Stith Brandegee, Allen Hiram Curtiss (who, among several persons listed, sent "the best" specimens), George Edward Davenport, Joseph Finley Joor, Thomas Minott Peters, Thomas Conrad Porter, Henry William Ravenel, John Robinson (of Salem), Arthur Carl Victor Schott, and George Vasey (whose specimens were "very poor").

The most important recipient of Mrs. Roy's specimens in the United States, in the context of pteridological history, was Daniel Cady Eaton of Yale University. Several of Mrs. Roy's collections were cited in *The Ferns of North America* (Eaton, 1877-1880), and some served as models for the magnificent illustrations by James Henry Emerton and Charles Edward Faxon. Eaton made some of Mrs. Roy's specimens available to John Gilbert Baker for inclusion in the exhibition of ferns at the Colonial and Indian Exhibition in London, U.K., in 1886 (Murphy & Synnott, 1979). The value of Mrs. Roy's fern specimens for these purposes is indicated by her standards for their preparation, as expressed to Bebb (in epist., 25 December 1871): "Those plants I collect myself are always *good spms*, as perfect, complete and well preserved as possible. I like to *send* and *receive* good plants, and unless it be the *larger plants* and *shrubs*, dislike very much *small parts.*"

Some Europeans also exchanged specimens with Mrs. Roy. Among these were Viktor Ferdinand Brotherus in Finland, John Fergusson and William Wilson in Scotland, Paul Friedrich Reinsch in Bavaria (Crowder, 1974), and at least one botanist in France (letters to Bebb). Specimens now at Leiden (ferns and flowering plants), Liege (ferns), and Oxford (bryophytes) indicate additional exchanges with European botanists (Vegter, 1983).

Mrs. Roy not only sought specimens from her correspondents for her own herbarium but also requested duplicates from which she might supply the desiderata of other correspondents. Likewise, her own shipments often included quantities that could be used by the recipients for further exchanges. Her own collections and desiderata very largely comprised mosses and ferns. On at least three occasions she asked Bebb for the names and addresses of persons who could provide moss and fern specimens from the western and southern United States. (Such specimens were eventually acquired.) She also collected and exchanged modest numbers of flowering plants. These were especially prominent among the material she received from Britain and Scandinavia, but were also present in shipments from American correspondents. Her desiderata of flowering plants emphasized species that she found especially attractive. Following her sojourn at Peaks Island, she asked Hall for the names of persons who could send algae from the coasts of Florida. Hall contributed some fungi, which Mrs. Roy submitted to the noted American mycologist Job Bicknell Ellis for identification.

The extent of Mrs. Roy's exchanges and the size of her own herbarium are indicated not only by the number of correspondents but also by references to parcels that were as large as postal regulations allowed. Another indication is the mention of a purchase of 300-400 specimens of sedges, evidently a secondary interest, in 1870 (in epist. to Bebb, 15 March 1872). This purchase was unusual, as Mrs. Roy preferred to exchange specimens, but she also mentioned the purchase of a set of exsiccatae, containing "fine European ferns," from the Prussian cryptogamic botanist Gottlob Ludwig Rabenhorst (in epist. to Bebb, 1 March 1872).

Mrs. Roy's collections of bryophytes constitute the first significant attention to be given to the rich bryoflora of the Owen Sound and Bruce Peninsula area (Crum, 1966). The lasting importance of these records is evident from the number of specimens cited by Crum ca. 95 years later. Among the most notable of the bryophytes found by Mrs. Roy and Macoun in 1871 were *Hylocomium brevirostre* (Brid.) B.S.G., for which their specimen remains the only record from Ontario, and *H. pyrenaicum* (Spruce) Lindb., for which there are few Ontario records and probably none earlier. In 1876, Mrs. Roy discovered *Calliergon richardsonii* (Mitt.) Kindb. ex Warnst. at Owen Sound, the southernmost station known for this boreal species. (Moss names follow Crum, 1966.)

Mrs. Roy's "botanical herbarium," which was doubtless large and presumably would have been, in her time, of significant monetary value, was specifically mentioned in her will, prepared in 1874, in which all of her "real and personal estate, including ... [her] books, jewelry and chattels" were left to her son, Alexander Keeler Roy, a Toronto stationer.[17] As executor, however, A.K. Roy deemed it necessary only to list bank stocks in his account of the

[17] Two other children, Jessie and Willie, predeceased Mrs. Roy. However, according to songwriter Doc Williams (pers. comm., 1987), the song "Willy Roy, the Crippled Boy" was based on the life of a boy in Dover, Ohio, although coincidentally both boys lived to about the age of nine.

estate. Many historic specimens from Mrs. Roy's herbarium are now at QK, including mosses contributed by the Scottish bryologists Fergusson and Wilson, still bearing the collectors' original labels (Crowder, 1974). Largely because of these labels, specimens at QK have been interpreted as comprising the bryological portion of Mrs. Roy's own herbarium, as indicated by "Canada (bryophytes): ... QK (orig.)" following Mrs. Roy's name in Vegter (1983). Fergusson and Wilson, however, provided sufficient material for further exchanges by Mrs. Roy, and may well have supplied duplicate labels. Therefore, these and Mrs. Roy's own bryophyte specimens at QK, despite their quantity, may be merely what she sent to Fowler. Only a modest number of fern and lycosphen specimens collected by Mrs. Roy, all of them dated 1872, are now at QK, indicating a different disposition of at least her vascular-plant herbarium. Nothing appearing to represent the "original" has been encountered in this study.

The most significant nineteenth-century botanical expedition in the Canadian basin of Lake Huron, in the total number of species collected and in the data obtained on the distribution of rare and disjunct species, took place in July and August 1874. The party comprised John Macoun, then professor of natural history at Albert College and University; John Gibson, then also on the Albert faculty; and James Burns, an amateur naturalist from Bayfield. They began their explorations along the Ausable River near Arkona, and proceeded north along the shore of Lake Huron, with departures inland along the Bayfield, Maitland, and Saugeen rivers and into the sand plains near Port Franks. They explored the pannes and alvars of the west coast of the Bruce Peninsula, the bogs and fens of the interior, and the Niagara Escarpment along the east coast. The expedition terminated at Owen Sound, where they remained from 27 July through 10 August.

Macoun's associate on this expedition, John Gibson, was a native of Bayfield, Huron County, and had graduated from the University of Toronto in 1872. Subsequently, he served as head master of Almonte High School,[18] as a faculty member of Albert University, and, after his expedition with Macoun, as professor of natural science at the newly founded Normal School in Ottawa. Prior to his field work with Macoun, Gibson had published a study of the geology of his native county (Gibson, 1873), based on a paper prepared as an undergraduate; this publication indicated considerable expertise in the earth sciences, and earned him election as a Fellow of the Geological Society (London, U.K.). During these geological studies, Gibson recorded a number of floristic observations that were later cited by Macoun, but these do not appear to have been documented by specimens. Macoun and Gibson, while both were on the Albert faculty, planned to write a descriptive flora of central and eastern Canada, to appear in installments. Toward this end, they wrote and published a monograph on the Caryophyllaceae of the Great Lakes - St. Lawrence watershed (Gibson & Macoun, 1875?), which contained descriptions of the taxa as well as citations of specimens. That Gibson was the senior author of this monograph, along with his credentials and experience and his recognition in Scotland, indicates that, had he lived longer, he would likely have become one of Canada's foremost botanists. Unfortunately, his promising career was cut short by his early death, attributed to typhoid fever, contracted on a scientific expedition to the northwest shore of Lake Superior in 1876 (Anonymous, 1876, a,b; Webb, 1877).

[18] At this time another notable plant collector, Rev. John Kerr McMorine, (1842-1912) was rector of St. Paul's Anglican Church in Almonte. Gibson, however, was the son of a Presbyterian pastor.

The first of the papers that resulted from Macoun and Gibson's expedition in 1874 (Gibson & Macoun, 1875a) included an extensive discussion of the relationships between plant distribution and edaphic factors, reflecting Gibson's knowledge of Pleistocene geology and his studies of the physiography of Huron County. The long list of species encountered (Gibson & Macoun, 1875b) included Carolinian species, such as *Cornus florida* L., from the Ausable Valley; prairie species, such as *Euphorbia corollata* L., and other psammophytes, such as *Helianthemum canadense* (L.) Michx., from outwash plains and the stablized dunes of former shorelines; and boreal species, such as *Pinguicula vulgaris* L., from the Bruce Peninsula. This was the first major botanical exploration of the Bruce Peninsula, and a number of species of restricted distribution, mostly from the dune-panne complexes, were first reported from the Peninsula at this time. Among these were *Spiranthes romanzoffiana* Cham., *Parnassia parviflora* DC., *Primula mistassinica* Michx., *Cacalia plantaginea* (Raf.) Shinners (as *C. tuberosa* Nutt.), *Solidago ohioensis* Riddell, and *Prenanthes racemosa* Michx. The thoroughness of their floristic studies is indicated by the 52 taxa of *Carex*. Numerous bryophytes were also among the specimens, including several that were noteworthy because of the limited extent of bryological collecting in Ontario until that time.

Macoun was in Barrie in August 1878. On this occasion he discovered *Cardaria draba* (L.) Desv., the first Canadian record for a naturalized species still uncommon in Ontario although now abundant farther west.

In June 1884, John Macoun and his son William Tyrrell Macoun (1869-1933), who later became Dominion Horticulturist, went to the vicinity of Lake Nipigon, north of Lake Superior, which had recently been made accessible by the construction of the Canadian Pacific Railway. En route, the senior Macoun collected some specimens at Sudbury (then called Sudbury Junction), probably while waiting for a train. These, which included a number of mosses cited in Part 6 of his *Catalogue,* appear to have been the first botanical specimens from the interior of the Sudbury District.

Macoun was again botanizing at Owen Sound in September 1890, and at Southampton in August 1901. Also of interest in the present context is his study of the flora and fauna of Algonquin National [now Provincial] Park in 1900, in which he and fellow naturalist William Spreadborough (1856-1931); on whom see Taverner, 1933, and Barnhart, 1965) traveled by canoe throughout much of the park as it was then bounded (Macoun, 1922; Brunton, 1979).

Macoun sent replicates of his collections to many individuals and institutions in North America and Britain. He generally felt competent to identify the flowering-plant specimens himself, although George Newton Best of Rosemont, New Jersey, was consulted on *Rosa*. T.J.W. Burgess (infra) collaborated on the ferns. The non-vascular plants were sent to specialists for identification. Early lichen collections were sent to Edward Tuckerman; later ones went to John Wiegand Eckfeldt. Coe Finch Austin identified the early collections of liverworts; after Austin's death, this role was assumed, consecutively, by William Henry Pearson and Alexander William Evans, with occasional contributions by Lucien Marcus Underwood. William Starling Sullivant and Thomas Potts James were the recipients of Macoun's early moss specimens. Later, Caroline Coventry Haynes and a number of other American bryologists (listed by Macoun, 1922) were sent mosses for identification. Eventually, as other bryologists declined to accept the large numbers of moss collections, many of which consisted of mixed material under a single number, Macoun came to rely on Nils Conrad Kindberg,

of Linkoping, Sweden, for bryological identifications. Although Macoun's greatest direct contributions to the knowledge of the Canadian flora came from his collections of vascular plants, it was the mosses sent to Kindberg that had the greatest impact on nomenclature. Kindberg based hundreds of new "species" on Macoun's specimens; few of these are currently accepted (Steere, 1977). Of those given names typified by specimens from Owen Sound, only *Seligeria campylopoda* Kindb. ex Macoun & Kindb., of which the type was collected by Macoun in 1890, is recognized in modern bryological works (see Ireland & Ley, 1984). (Biographical data on the recipients of specimens mentioned above can be found in works cited by Barnhart, 1965.)

In 1870, Andrew Thomas Drummond (1843-1921) published a paper on rapidly colonizing plant species associated with disturbed habitats, a subject that had hitherto been discussed in a few papers by botanists in the United States, but which had scarcely been mentioned in a Canadian context. Although his discussion included adventive and naturalized species, emphasis was on species that were native to eastern North America but had expanded their ranges and greatly increased in abundance in historic times (now called apophytes). Drummond, a student of George Lawson's, had been Queen's University's youngest alumnus in 1860, and became, as designated by Beschel (1966), "the first Canadian lichenologist." He also authored a number of other papers on ecology and phytogeography, including another notably original work on "The colours of flowers in relation to time of flowering." He was a pioneer in the promotion of sound forestry practices, especially governmentally supported reforestation, and was active in the founding of the Canadian and American forestry associations. By profession, Drummond was a lawyer and later, after his hearing deteriorated, a financier, involved particularly with railroad construction. His activity in botany extended only to the mid-1890s, after which time he donated his herbarium of ca. 2000 specimens to Queen's University (QK). He had corresponded extensively with the leading American lichenologist of the time, Edward Tuckerman, to whom he gave replicates of some of his lichen collections. (On Drummond, see Rose, 1888; Morgan, 1898; Anonymous, 1923; and Beschel, 1966.)

Drummond's (1870) aforementioned paper included a number of references to Lake Huron localities, some being merely statements of distribution, e.g., that *Ranunculus sceleratus* L. ranged north to "the southern shores of Georgian Bay," but others being more specific. Examples of the latter include observations that *Rudbeckia hirta* L. was "frequent in grain fields around London and on St. Joseph's Island, Lake Huron," and that *Verbena hastata* L. was "indigenous ... [on] the Manitoulin Islands." Some of these observations, however, e.g. the spreading tendency of *Corydalis aurea* Willd. on Manitoulin Island and the presence there of *Arenaria serpyllifolia* L., were attributed to Robert Bell. Elsewhere in the paper Drummond cited publications, correspondence, and specimens collected by Lawson, Macoun, James Barnston, Louis-Ovide Brunet, Asa Gray, Léon Provancher, and Berthold Carl Seeman. No specimens have been encountered in the present study to indicate that Drummond himself did any botanizing around Lake Huron, although he did collect specimens from a number of Ontario and Québec localities, notably, at least in the context of bryology, London, Rice Lake, and Tadoussac, according to Crowder (1974).

David Allan Poe Watt, mentioned earlier as a recipient of some of Hincks's fern specimens, was a shipping and exporting merchant in Montréal, a patron of

the arts, an advocate of equal educational opportunities and suffrage for women, and an amateur ichthyologist and botanist. He contributed to botany largely through promotion and recruitment and through financial support. He was a particularly active member of the Natural History Society of Montréal, serving for a number of years as editor of its journal, *The Canadian Record of Science,* and was also a plant collector and author of botanical papers himself, being especially interested in ferns. Through his own collecting and through numerous exchanges and purchases, Watt amassed an herbarium estimated to comprise about 10,700 specimens, primarily of North American ferns and fern-allies, which was sold to the Missouri Botanical Garden after his death (Moore, 1920). For exchange purposes, Watt assembled sets of exsiccatae entitled *Filices Canadenses Collectae Distributaeque Cura D.A. Watt*. Most of Watt's collecting was done in Québec, but among the fern exsiccatae are some with the printed locality datum "Notttawasaga, C.W." [= Wasaga Beach], a few dated 1869 and 1871, others undated. The anachronistic "C.W." may represent indifference to the 1867 name-change to Ontario, rather than indicating that Watt's botanical collecting in this area began before Confederation. The account of his own botanizing, in his list of Canadian cryptogams (Watt, 1865), mentioned no field work in Ontario prior to its publication in October, 1865.[19] (On Watt, see Morgan, 1898.)

John Milne Buchan[20] served successively as head master of the Hamilton Grammar School, Inspector of High Schools for Ontario, and principal of Upper Canada College in Toronto (Anonymous, 1885; Bailey, 1981). In 1869, he joined with four physicians in an unsuccessful attempt to establish a medical school in Hamilton. He did most of his botanizing in the vicinity of Hamilton, where he had grown up. He did, however, collect some specimens in the Lake Huron watershed, probably as his duties as Inspector from 1873 to 1881 took him around the province. Records attributed to Buchan by Macoun (1883-1902; Gibson & Macoun, 1875b; Macoun & Gibson, 1876-1877) were based on a paper by Buchan (1874) on the flora of Hamilton and vicinity, which included a few records from other parts of the province. Among these were reports of

[19] In this paper, Watt listed *Polystichum braunii* (Spenner) Fée var. *purshii* Fern. (as *Aspidium aculeatum* Sw. var. *braunii* (Spenner) Doll) as occurring from the "Northern shore of Lake Huron (Abbé Brunet) to Kamouraska...," apparently on the basis of personal communication from Brunet. It seems, however, that this report must have been "second-hand," rather than based on Brunet's own field experience, and that it was probably erroneous. Maheux's (1960-1961) account of Abbé Louis-Ovide Brunet's life and botanical contributions does not indicate that Brunet had visited that part of Ontario prior to 1865, and Macoun & Burgess (1885), who were acquainted with Brunet's writings, knew of no Ontario records for this species. It has subsequently been found at a number of localities near the shore of Lake Superior and at a few widely separated sites in southern Ontario, but it remains unknown from the vicinity of Lake Huron except on Great Duck Island, where it was discovered in 1976 (Kett, 1980; Dickson & White, 1983).

[20] John Milne Buchan (1841-1885), Ontario educator, should not be confused with Hon. John Norman Stuart Buchan (b. 1911), later 2nd Baron Tweedsmuir, who collected botanical specimens on Baffin and Southampton islands, N.W.T., in 1938. Because the specimens at MTMG attributed to "Mr. J. Buchan" had been received by Macoun prior to 1876, it may be assumed that they were collected by John Milne Buchan, although John Stewart Buchan (1852-1925; B.C.L. McGill 1884; middle name evidently later altered to Stuart) served as Corresponding Secretary and Vice-President of the Natural History Society of Montréal in the early years of the twentieth century.

Claytonia caroliniana Michx. and *Viola selkirkii* Pursh ex Goldie, both from Walkerton and Owen Sound.

Buchan's (1874) paper included two lists, the smaller of which noted species collected by himself and constituted a supplement to the larger list, that of plants collected by Alexander Logie. Logie, a native of Nairnshire, Scotland, studied law in Kingston and established a law practice in Hamilton in 1848. From 1854 until his death in 1873 he was Judge of the County of Wentworth. He was one of the founders of the Hamilton Association for the Advancement of Literature, Science and Art, and served as its president and also as president of the Fruit Growers' Association of Upper Canada and the original Hamilton Horticultural Society. He published papers on edible wild plants and on the plants of Hamilton and vicinity. The latter paper (Logie, 1861) also listed a few plants collected at Mount Forest, Rocky Saugeen, and Collingwood. Buchan had access to Logie's herbarium, and he apparently listed all the species collected by Logie whether before or after Logie's own paper was written. A few more records from the Lake Huron area were thereby added, among which were *Cypripedium arietinum* R. Br., the ram's head lady's-slipper, from Goderich, the first report of this rare orchid from its now-famous Lake Huron populations; a few species from Collingwood and Parry Sound; and three *Lycopodium* species from Bruce Mines. (On Logie, see Anonymous, 1873; Buchan, 1874; Alexander & Dickson, 1901; and Laking, 1958.)

Henry Byron Spotton's place in Canadian botanical history is assured by his authorship of *Elements of Structural Botany* and *Wild Plants of Canada,* which, in many editions and printings, served as the standard texts for secondary-school botany in Canada for many years. Otherwise, Spotton is best known for his career as an educational administrator. Following graduation from the University of Toronto in 1864, he served as principal of the Beamsville Grammar School (1864-1868), principal of Barrie Collegiate Institute (1868-1892), First Principal of Harbord College Institute in Toronto (1892-1906), and Inspector of High Schools for Ontario (1906-1918) (Anonymous, 1933). It was while he was at Barrie that Spotton was most active in botany. During this period, he collected plants in the Barrie area, and published a list of 350 taxa encountered there (Spotton, 1876).

The present significance of the work of these three botanical authors has been diminished by the loss of documentation. Logie's private herbarium, after having been studied and published upon by Buchan, was returned to the Logie family, by whom it was donated to the Hamilton Association in 1900 (Alexander & Dickson, 1901; Laking, 1958), i.e., upon the death of Mrs. Logie. The Logie herbarium probably was not integrated with the general herbarium of the Association. In 1938, the Association's herbarium was given to McMaster University, but how many of Logie's specimens were still present is unknown. Except, apparently, for two sheets of *Onoclea sensibilis* L., there are no Logie collections at HAM, to which the McMaster herbarium was transferred in 1963. A few duplicates sent by Logie to George Lawson are now at CAN (Boivin, 1980),[21] and records at MTMG indicate that eight are at that herbarium. Buchan, unless he contributed his specimens to the Logie herbarium, presumably took

[21] After Lawson's death in 1895, his herbarium went initially to Mt. Allison University, where it was located when Lawson's type specimens were studied by Weatherby (1941). It was transferred to CAN in 1950 (Boivin, 1980).

his herbarium with him when he left Hamilton, but it, too, is evidently no longer extant. Twelve specimens contributed by Buchan, probably none from the Lake Huron basin, were included by Macoun in a set assembled for display at the United States Centennial Exposition at Philadelphia in 1876 and subsequently given to McGill University. The title of Spotton's (1876) paper indicates that he did collect specimens, but no later authors appear to have seen them. Soper (1956), for example, cited Spotton's records only as "published reports" rather than as "specimens examined." Spotton's paper on the flora of the Barrie area was his only published account of his field work, and it may be that his efforts had been directed toward developing an herbarium for use at the Barrie Collegiate Institute. If his herbarium had remained at that school when he left, it would have been destroyed by the fire that leveled the building about a year later (A.A. Reznicek, pers. comm., 1981). The herbarium at Harbord Collegiate Institute in Spotton's time was later discarded (J.L. Riley, pers. comm., 1982). Dr. Reznicek located one specimen at TRT, *Calypso bulbosa* L. from the Barrie area that Spotton had given to T.J. Ivey, but otherwise his searches for Spotton's specimens were unsuccessful.

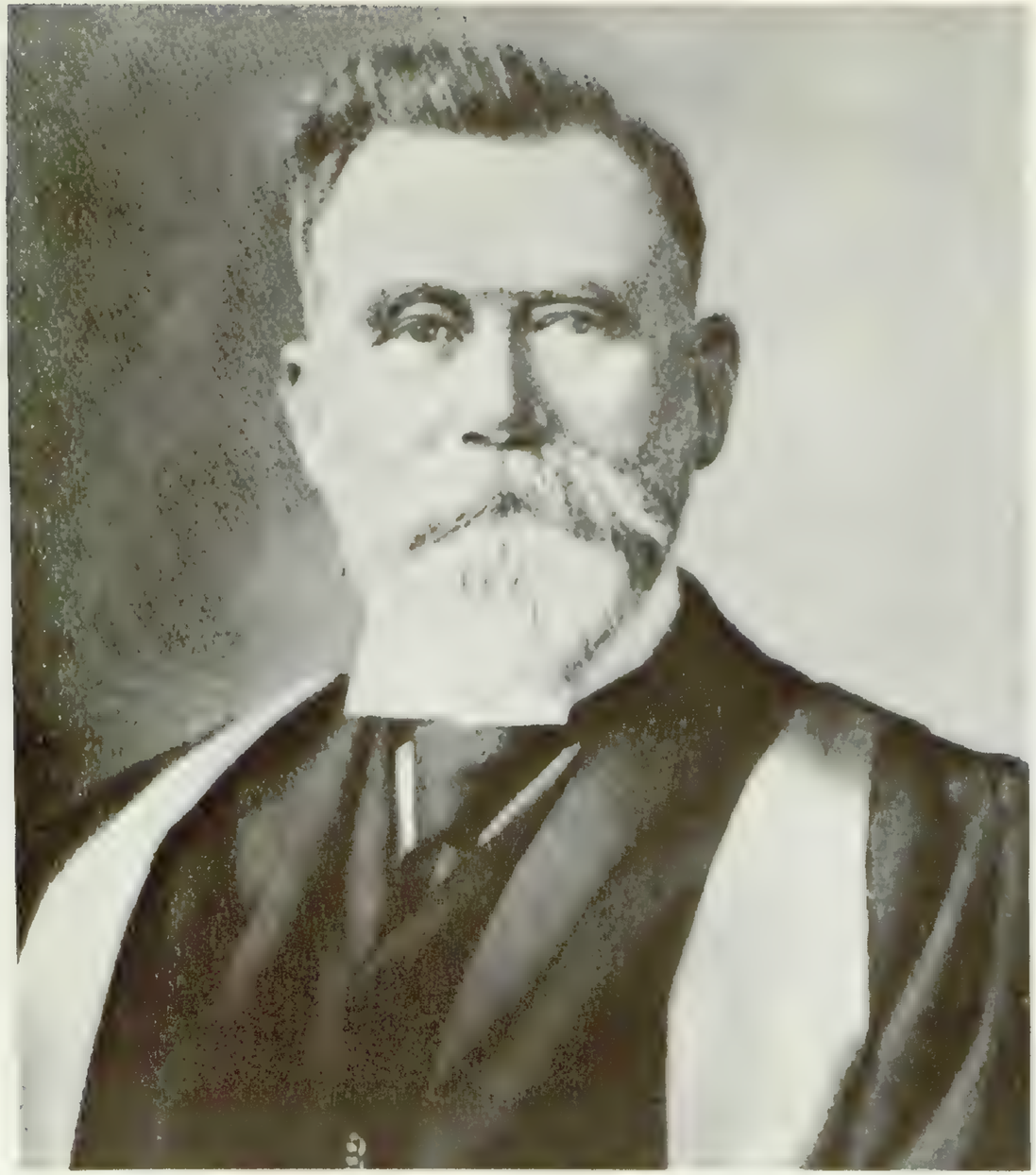
Dr. Thomas Joseph Workman Burgess was the son of a Toronto dry-goods merchant, but he was given his middle names after his godfather, a respected physician who was superintendent of the mental hospital in Toronto, and it was the latter's vocation that Burgess followed. After graduating from the Faculty of Medicine of the University of Toronto in 1870, Burgess served as physician and assistant superintendent at mental hospitals in Toronto (1870-1872), London, Ontario (1875-1887), and Hamilton (1887-1890). Despite the esteem in which he was held by his colleagues, he repeatedly "experienced the disappointment and humiliation of having new and inexperienced men promoted over his head" (Anonymous, 1907b), allegedly because of political influence. In 1890, Burgess left Ontario for the more satisfying post of superintendent of the Protestant Hospital for the Insane in Verdun, Québec. He continued to be active in the Ontario Medical Association, however, and pressed for civil-service regulations and an improved system of promotions in the provincial hospitals.

From its founding in 1881 until his departure from London, Burgess was also a member of the Faculty of Medicine of the University of Western Ontario. Later, beginning in 1893, he taught in the Faculty of Medicine at McGill University, where he provided the first lectures on mental disorders at any Canadian medical school. Believing in "as little restraint as practicable; none if possible," Burgess acquired a lasting reputation for his progressive and humane approaches to the treatment of mental patients. He was elected president of the American Medico-Psychological Association in 1905. His scholarly interests included the history of the treatment of the insane, on which he published a major treatise (Morgan, 1898; Morphy, 1926).

In addition, Burgess was one of the most knowledgeable amateur botanists in Canada in his time, as indicated by his several published works in this field, especially his discussion of profitable areas for botanical research (Burgess, 1896). His coming to Hamilton greatly stimulated botanical activity in the Hamilton Association for the Advancement of Literature, Science and Art, and, with Andrew Alexander (infra), he established the Association's herbarium in March, 1889, contributing 87 specimens he had collected the previous year for that purpose (minute books of the Biological Section of the Hamilton Association, now in the Hamilton Public Library). Burgess was regarded as "the highest authority on Canadian ferns" by Macoun, for whom he prepared the treatment of the ferns in the *Catalogue of Canadian Plants*. Four of Burgess's

The North American hart's tongue, *Phyllitis scolopendrium* (L.) var. *americanum* Fern., photographed in Mono Cliffs Provincial Park. Herbarium specimens of this rare fern, which reaches its greatest abundance along the Niagara Escarpment in Grey County, have been useful as indicators of who botanized when in Grey and adjacent counties.

The Rocky Saugeen River where it is crossed by Highway 6, originally the Garafraxa Road. Rev. Charles Cameron served a church near this site, and several other Ontario naturalists botanized here including Alexander Logie, H.M. Ami and F.J. Eames.



Robert Bell. (From Proc. & Trans. Roy. Soc. Canada, ser.III, 12(Proc.):facing p.X. 1919.)

William Hincks. (Photograph courtesy of the University of Toronto Archives.)

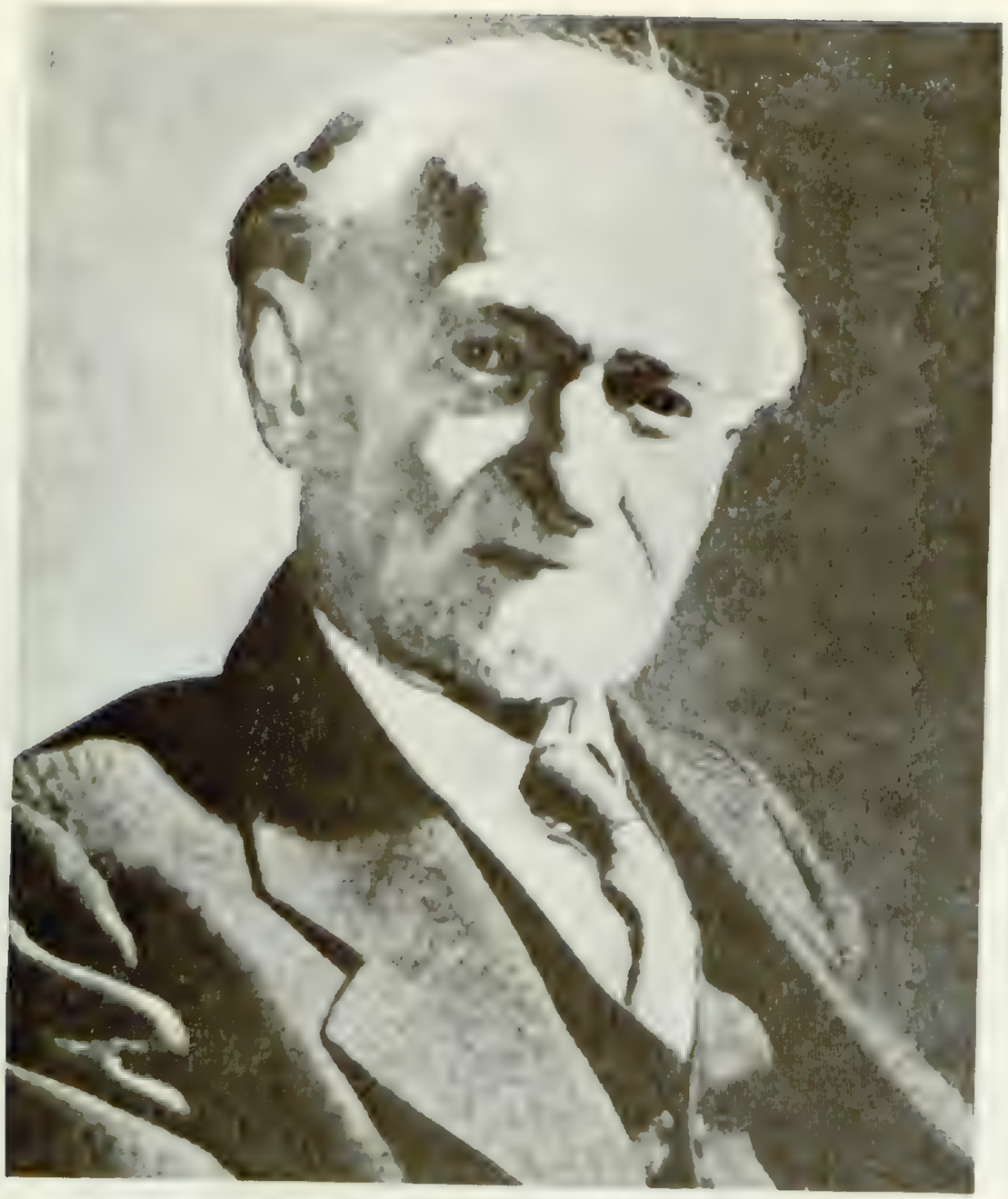
Jessie D. (Mrs. William) Roy probably ca. 1872. (Photograph courtesy of the Hunt Institute for Botanical Documentation; original in the Field Museum of Natural History, probably from correspondence from Mrs. Roy to Michael S. and Anna E. Bebb.)

D.C. Eaton's *Ferns of North America,* open to the plate of *Aspidium filix-mas* (L.) Sw. (now *Dryopteris filix-mas* (L.) Schott), the male fern, painted by C.E. Faxon from a specimen collected by Mrs. Roy near Owen Sound.

A portion of the dune--panne complex at Red Bay on the Bruce Peninsula, now part of the St. Jean Point Nature Preserve. A number of rare plant species were discovered in this area by John Macoun and John Gibson in 1874.

Dr. Thomas Joseph Workman Burgess, 1907. Dr. Burgess received several honours that usually involved publication of a portrait of the person thus honoured, but, despite extensive searching, this was the only likeness of Dr. Burgess that could be found. (From *The News* [Toronto], new ser. vol. 27, no. 110, May 29, 1907, p.1; sketch reproduced with permission of MacLaren Publishing Ltd.)

Asplenium ruta-muraria L., wall-rue, photographed near the lighthouse on Flowerpot Island, where it was discovered by Dr. P.J. Scott in 1892.



John Dearness on his 100th birthday. (From Talman, 1957.)

Andrew Alexander, ca. 1897. (From Dickson 1898.)

other botanical publications (one with Macoun) dealt with fern records; others dealt with *Rhus* and with orchids. He assembled a special collection of *Viola* specimens, with contributions from Dr. Ferdinand Blanchard of Peacham, Vermont, who was an authority and author on *Viola*, and from several European specialists, but he did not publish on this genus. He also assembled a lichen herbarium, in which is own collections (often made with Macoun) were supplemented by gifts and exchanges from Macoun, Mmes. Roy (supra) and Saunders (infra), and others (records, MTMG).

Although many of Burgess's plant specimens were obtained in the vicinities of London and Hamilton, he travelled widely and collected plants "from Cape Breton to British Columbia" (Burgess, 1896). Many of his collections from west of Lake Superior were made while he served as surgeon to the British American Boundary Survey, which was headed by the noted Canadian geologist George Mercer Dawson, in 1872-1875. Prior to 1876, Burgess began botanizing in the vicinity of Parry Sound and the resort areas east of Georgian Bay, where, on the shores of Lake Joseph and Muskoka Lake, he discovered the isolated Muskoka populations of *Rhexia virginica* L., the meadow beauty.[22] Other rare and disjunct species were found by Burgess in the Muskoka and Parry Sound districts in the 1870s and 1880s, including *Lycopodium sabinifolium* Willd. at Crane Lake, *Dryopteris fragrans* (L.) Schott at Moon River, *Woodwardia virginica* (L.) J.E. Sm. at Lake Joseph, and *Xyris montana* Ries (*X. flexuosa* Muhl. ex. Ell. var. *pusilla* A. Gray) at Blackstone Lake and Lake Joseph. Burgess's collection of *Myriophyllum tenellum* Bigelow at Lake Joseph, apparently the second Ontario record for the species, particularly well illustrated his keen observation and knowledge of plants, since these small, pale aquatic plants are easily overlooked. In 1880, Burgess visited Manitoulin Island; in 1883, he found *Origanum vulgare* L. naturalized at Hawkestone, near Orillia; and in 1884 he went to Owen Sound and Southampton (then also known as Saugeen), and collected some of the characteristic species of the Niagara Escarpment and the dune-panne complexes. Noteworthy specimens from Southampton included *Selaginella selaginoides* (L.) Link, at its southernmost station on the Lake Huron shore, *Dalibarda repens* L., and *Cacalia plantaginea* (Raf.) Shinners (*C. tuberosa* Nutt.). *Athyrium pycnocarpon* (Spreng.) Tidestr. (*Asplenium angustifolium* Michx.) was found at Lucknow about this time. Also, while he lived in London, Burgess visited localities on the southeast shore of Lake Huron, including Port Franks in 1883 and Point Edward in 1887.

Burgess's interest and expertise in botany became well known to his colleagues in the medical profession, and several of them from time to time sent him specimens that they considered rare or interesting or had been unable to identify. Thus, indirectly, Burgess continued to contribute to the knowledge of the Canadian flora after his own field work had been curtailed by his increased administrative responsibilities at Verdun. One of the physicians who contributed specimens to Burgess's herbarium was Charles Merrill Smith, who had graduated

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[22]Macoun & Gibson, in 1876, noted the presence of *Rhexia virginica* at Lake Joseph, on the basis of observations by Burgess. The oldest extant specimen of this species from the Muskoka Lakes region located in the present study, and in research on the distribution of *R. virginica* in Ontario by Mirek J. Sharp (pers. comm., 1982), was collected by Burgess at Blackstone Lake in 1878.

in medicine from the University of Toronto in 1870.[23] Smith's contributions consisted mostly of ferns and orchids, collected while he was practicing at Owen Sound during the 1870s. Smith moved from Owen Sound to Orangeville in 1879. He remained there until he moved to British Columbia, where other members of his family lived, in 1905. He practiced in Summerland until his retirement in 1912, while residing in nearby Peachland (Rose, 1886; Storey, 1979; Anthea N. Yeomans, in epist., 1985). No indication that Smith collected botanical specimens or engaged in other natural-history avocations after he left Owen Sound has been encountered in this study.

Probably the most active plant collector among Burgess's physician correspondents was Dr. Patrick John Scott, of Southampton, who received his medical degree from Queen's University in 1888 (Anonymous, 1944). Scott's interest in the native flora may have been stimulated by Burgess's visit to his home town in 1884, presumably as a guest of Scott's father, who was also a physician in Southampton. Scott began collecting while a student, at least as early as 1885, when he sent specimens of *Iris lacustris* Nutt. from Southampton to Burgess. His most significant botanical discovery was made in 1892, when he found a fern on Flowerpot Island, off the tip of the Bruce Peninsula, that Burgess (1892) identified as the first record of *Asplenium ruta-muraria* L. s. lat. for Canada. In 1901, Scott discovered another population of this rare species on Manitoulin Island; on this occasion, the specimen was sent to Macoun at the Geological Survey. Printed labels headed "Ex Herb. P.J. Scott" (e.g. on *Asplenium viride* Hudson from Flowerpot Island, at QK indicate that Scott, by the mid-1890s, was engaged in considerable collecting for exchange purposes. In addition to Burgess and Macoun, Absalom Cosens and John Dearness (infra) were among the principal recipients of his specimens.

The name of Sarah Agnes Robinson Saunders has long been familiar to historians of biology as that of the matriarch of a family that included several distinguished professional and amateur scientists (Pomeroy, 1956). It is only relatively recently, however, that Mrs. Saunders' own botanical contributions have come to light (Dore, 1970). While the Saunders family lived in London, Ontario, from 1857 to 1886, Mrs. Saunders assembled a private herbarium comprising mostly rare species that she had found in southern Ontario. Most of her botanizing was done near London, but in August, 1878, the family stayed at Point Farm, a resort hotel ca. 8 km north of Goderich (now a provincial park), where Mrs. Saunders collected several specimens, including *Samolus parviflorus* Raf. A few other specimens were obtained at Port Franks in 1879 and along the St. Mary's River at Sault Ste. Marie in 1880. W.E. Saunders (infra) also participated in the botanizing on the latter occasion. As well as having her own herbarium, Mrs. Saunders contributed specimens to that of T.J.W. Burgess.

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[23] Dr. (Charles) Merrill Smith, the Owen Sound physician, was not, of course, the Rev. Dr. (Charles) Merrill Smith, Methodist clergyman, who wrote the "Reverend Randollph" detective novels.

Later, one of Mrs. Saunders' sons, the polymathic William Edwin Saunders,[24] established an international reputation as "the dean of Ontario field naturalists." Saunders, a graduate of the Philadelphia College of Pharmacy in 1883, operated a pharmaceutical manufacturing and wholesale business in London and also taught chemistry at the London Medical College (Anonymous, 1943; Cross, 1947; Rutter, 1949; Pomeroy, 1956). His avocational interests were chiefly in ornithology and mammalogy, but he also collected plants, at localities including Wiarton in 1899. The Bruce Peninsula was one of his favourite areas for natural-history studies; he visited the area eight times between 1887 and 1930. He was especially interested in ferns, as indicated by his specimens and by his papers on the ferns of the Bruce Peninsula and Flowerpot Island (Saunders, 1929a,b). He distributed some botanical specimens to other collectors, e.g. Noah Miller Glatfelter of St. Louis.

Henry Marc Ami, upon graduating from McGill University in 1882, joined the staff of the Geological Survey of Canada in Ottawa, and became one of the most active members of the newly founded Ottawa Field-Naturalists' Club. His career and his most significant scientific accomplishments were in paleontology, but anthropology, ornithology, and botany were also among his diverse interests, and within a few years he had "made pretty extensive collections of plants in several parts of Canada, and added a few to the Canadian flora" (Rose, 1886). The localities in which Ami collected specimens that were cited by Macoun (beginning in Part II of the *Catalogue,* 1884) included dolomitic outcrops near Durham, where he found several uncommon fern species in 1883,[25] and the interdunal habitats near Port Franks. (On Ami, see Rose, 1886, Morgan, 1898, Huntsman, 1931, and Reddoch, 1976.)

James Melville Macoun, John Macoun's son and associate in the Geological and Natural History Survey of Canada, was an important botanical explorer of many parts of Canada and the author of many papers on the Canadian flora. However, he qualifies for mention here only because of specimens collected at Point Edward, just north of Sarnia, in September 1884 (Fox & Soper, 1954). (On J.M. Macoun, see Malte, 1920; Waiser, 1986; and numerous biographical and bibliographical references listed by Ewan & Ewan, 1981, and Stafleu & Cowan, 1981.)

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[24]William Edwin Saunders is to be distinguished from his father, William Saunders (1836-1914), who was also a noted naturalist. The senior Saunders's interest in the flora of the London area led to his recognition of many medicinal plants, and this in turn led to the establishment of the pharmaceutical business later taken over by W.E. Saunders.

[25]Among these, allegedly, was the only record of *Aspidotis densa* (Brackenr.) Lellinger, Indian's dream (then called *Pellaea densa* (Brackenr.) Hook.; a.k.a. *Cheilanthes siliquosa* Maxon), for Ontario. Marquis & Voss (1981) and others have been skeptical about this report, suspecting that incorrect locality data had become associated with this specimen, which was identified (by Macoun) ten years after its collection. Ami (1894) wrote an article for the sole purpose of reporting this fern for Ontario, in which he seemed quite certain about the source of this specimen, even describing details of its habitat. Ami had, however, found *Cryptogramma stelleri* (S.G. Gmel.) Presl, then called *Pellaea gracilis* (Michx.) Hook., at the same site from which he reported *P. densa* ("On Guelph dolomite, Little Saugeen [now Rocky Saugeen] River, Durham"; Burgess, in Macoun, 1883-1902), and it seems possible that Ami's recollections were actually of the habitat of *C. stelleri.* Ami also found *Phyllitis scolopendrium* var. *americanum* at this locality.

Sir (John) William Dawson (1820-1899; at McGill 1855-1893), one of nineteenth-century Canada's most distinguished scholars, taught botany at McGill from 1858 through 1882. During the latter part of this period, and from 1883 through 1910, when botany was taught by David Pearce Penhallow (1854-1910), numerous specimens selected from student collections were added to the University herbarium (MTMG). Twenty-nine such specimens, including at least one from the Lake Huron watershed (*Euonymus obovatus* Nutt. from Sable, near Parkhill, 30 May 1883), were collected by James Ezra Gray, a medical student from Coldspring, Ontario, northwest of London. Gray was registered in the McGill Faculty of Medicine from 1882 to 1884, but did not receive his degree (records, The Graduates' Society, McGill University). Gray later enrolled in the Faculty of Medicine, University of Western Ontario, from which he received his M.D. ca. 1889. He practiced for a few years in Delaware, Ontario, then possibly because he had not qualified for registration by the Ontario College of Physicians and Surgeons and was encountering increasing legal opposition to his practice, he moved to New York State ca. 1894 to enter the employ of a proprietory medicine company. This phase of his career was terminated by addiction to morphine, for which he was committed to the mental hospital at Rochester in 1904. After his release, he devoted much of his energies to protesting conditions and treatments in North American mental hospitals in general and at Rochester in particular (Anonymous, 1907 c,d).[26]

A search among specimens of characteristic species of the Lake Huron shores also revealed a specimen of *Hypericum kalmianum* L. from Lake Huron, collected in 1871 by "J. Anderson." This presumably was James Alexander Anderson, from Tiverton, who received his B.A. from McGill in 1877 and shortly thereafter became a Presbyterian pastor, first at Whitechurch, near Wingham, then at Goderich, where he spent the rest of his life (Anonymous, 1910b). How many other specimens collected by this student are now at MTMG has not been determined in this study, because the herbarium accession books — generally an excellent resource for botanical historians — do not always suffice to distinguish among several Andersons, including James Anderson (1812-1867), one of two chief factors by that name employed by the Hudson's Bay Company and later an explorer in the search for Franklin, and James Robert Anderson (1841-1930), a naturalist in Victoria, British Columbia.

The greatest congregation of field botanists in the Muskoka Lakes area to that time, and probably to the present, took place from 31 August to 2 September 1889, in connection with a meeting of the Botanical Club of the American Association for the Advancement of Sciences in Toronto. According to Day (1889a), about fifty members participated in the Muskoka trip. About half were accommodated at Port Cockburn, at the northern end of Lake Joseph, and the rest at Port Sandfield, near the southern end of the same lake.[27] However, in discussing publications and herbarium specimens, only two persons, who were in effect leaders of the expedition, need be emphasized.

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[26] James Ezra Gray should not be confused with James Gray (1855-1944), M.D. McGill 1883, of Seaforth, who is not known to have collected plant specimens; nor with John Edward Gray (1800-1875) of the British Museum, who made significant accomplishments in botany, but not in Canada.

[27] Lake Joseph, Lake Rosseau, and Lake Muskoka were sometimes regarded as one lake at the time, with the result that species actually found at Lake Joseph were reported from "Lake Muskoka."

David Fisher Day, who published an account of the trip and its discoveries (Day, 1889a), was one of the more senior participants and one of the most accomplished in botany. By profession a lawyer in Buffalo, he had written floras of the Niagara Falls and Buffalo areas and several lesser botanical papers. With George William Clinton and Charles Curtis Fenn Gay, he had founded the herbarium of the Buffalo Society of Natural Sciences and was one of its most active contributors of specimens. (On Day, see Cowell, 1900.)

Nathaniel Lord Britton, as of 1889, had been instructor in botany at Columbia University in New York City for three years, but his greatest accomplishments lay well into the future. (In 1896, he became the first director of the New York Botanical Garden, which had come into being very largely as a result of his initiative. The same year saw the publication of the first volume of the first edition of his long-standard *Illustrated Flora*.) Although it was Day who published the "official" record of the expedition,[28] it was evidently Britton who made the greatest contribution in collecting specimens and bringing noteworthy discoveries to the attention of the botanical community, as indicated by citations of the *Subularia* discussed below. Quite likely it was also Britton who discovered and/or identified most of the more significant plants. (Biographical material on Britton is copious; see citations by Stafleu & Cowan, 1976, especially Howe, 1934, and Merrill, 1938.)

As observed by Day, the basin of Lake Joseph is granitic, and therefore the party encountered a number of oxylophytes for which there were few Ontario records, as most of the botanical exploration of Ontario to that time had been in the calcareous regions. Day's (1889a) report listed several aquatic species, mostly characteristic of oligotrophic lakes, that he believed were previously unknown for Ontario. In most cases, the first-record status was erroneous, as they had already been reported for Ontario by Macoun in the earlier parts of his *Catalogue. Subularia aquatica* L. [ssp. *americana* Mulligan & Calder] and *Elatine minima* (Nutt.) Fisch. & Mey. (then included in *E. americana* (Pursh) Arnott) were, however, genuinely new for the province. The *Subularia,* found at Slater's Bay near Port Sandfield, was the subject of a separate paper by Day (1889b), because there were at that time very few records of this species from any North American localities. Day (1889a) also listed all of the 191 species observed, most of which were reported from Port Cockburn and Port Sandfield, with others from Toronto, Gravenhurst, and a few other localities en route.

Among the other participants mentioned by Day (1889a), those whose contributions to the plant sciences qualified them for listing by Barnhart (1965, q.v. for biographical references) included Thomas Jonathan Burrill (1839-1916), professor of natural history at the University of Illinois, who had already made significant achievements both in floristics (in Illinois and Colorado) and in the study of bacterial diseases of fruit trees; John Francis Cowell (1852-1915), then professor of forestry at the University of Buffalo, who later became director of the Buffalo Botanic Garden, botanized with Britton on St. Kitts, and did botanical exploration in Panama on behalf of the New York Botanical Garden; and Thomas Meehan (1826-1901), proprietor, with his son, of a Germantown, Pennsylvania, nursery, who had previously botanized in Colorado and Utah and along the coasts of British Columbia and Alaska, and who later

[28] The title of a paper by Katherine Benedicta Trotter Claypole (1890), who presumably also participated in the Muskoka trip, implies something of a record of the expedition, but is actually a discussion of the habitats of three of the species as she had observed them in Europe.

founded *Meehan's Monthly*, a journal of horticulture and amateur field botany. (If specimens from this trip were preserved by Cowell, Burrill, or Meehan, they should be sought at BUF or NY, ILL, and PH, respectively.) A few other persons, not listed in references on botanists and plant collectors, were mentioned by Day as having reported observations. No records of specimens collected by these individuals have been encountered in the present study.

Private herbaria and local scientific societies

Toward the end of the nineteenth century, botanical collecting increased greatly in Ontario as elsewhere. This was particularly true in the rapidly developing resort and cottage area east of Georgian Bay, where vacationers from distant points doubtless collected occasional specimens that are now in widely scattered herbaria. Emphasis in the following paragraphs is on those persons who distinguished themselves as scientists and/or educators, or who were active in scientific and cultural organizations; and those who collected especially large numbers of specimens, or botanized in areas visited by few if any other plant collectors of their time.

This was the era in which local scientific and cultural associations were springing up in cities throughout North America (see Voss, 1978, pp. 62-63, and Burger, 1983, pp. 5-18.) Through promoting communication among the members, publishing journals, operating museums, and benefitting from the leadership of some prominent scholars (including John Macoun and H.M. Ami in Ottawa and T.J.W. Burgess in Hamilton), these local societies greatly stimulated natural-history studies.

Some of the local scientific societies evolved from the Mechanics' Institutes that had been established across the province as urban centres developed, beginning in the 1830s and burgeoning in the 1850s. In their functions, the Mechanics' Institutes were the predecessors of the public libraries and adult-education programs, and in some cases of museums as well. Because the course of evolution from Mechanics' Institute to "literary and scientific society," as the later organization might be known, and then to more specialized groups varied from city to city, it cannot be stated definitely which was the first scientific society in present-day Ontario. Probably the strongest contender for this distinction is the Royal Canadian Institute (on which see Anonymous, 1899, and Wallace, 1949), founded in 1849 as an association of architects, civil engineers, and surveyors practicing in Toronto. When attendance dropped to two at a meeting in 1850, it was decided that membership should be less restricted, and the Institute accordingly had much-diversified roles when it was incorporated in 1851. The following year it began publication of *The Canadian Journal* (full title varied), to serve not only its own membership but also the Mechanics' Institutes and "all other Societies of a Scientific character" in Canada.

From 1885 through 1893, the Canadian Institute, as it was then known, included several sections, one of which was the Biological Section, with (as of 1890) Botanical, Microscopical, and Ornithological sub-sections. (The Biological Section had existed independently from 1878 to 1885 as the Toronto Natural History Society. Legally, the Society, having been incorporated under that name, continued to exist concurrently with the Section.) The Biological Section had an herbarium, which was incorporated into TRT in 1925. The distinctive grey mounting-sheets are often deficient in data, especially as to the

names of the collectors. Two persons, however, may be noted as having contributed specimens to this herbarium from Muskoka District, namely Charles W. Armstrong, who generally provided only the imprecise locality datum "Muskoka," and Alice Hollingworth, who botanized at Beatrice, ca. 13 km north of Bracebridge.

Charles William Armstrong[29] was the most active member of the Botanical Sub-section, which he served as secretary throughout its existence. During this time he collected numerous specimens for the herbarium, mostly from the Toronto area, and established an exchange with the United States National Herbarium. In 1893, when most of the sections of the Canadian Institute had either evolved into autonomous organizations or, conversely, gone into decline, Armstrong was one of a group of Toronto naturalists and biologists who attempted to perpetuate the Biological Section as the Biological Society of Ontario.[30] The Society promptly launched *The Biological Review of Ontario,* of which one volume of four issues was published in 1894. The journal, at least, began auspiciously, with a good balance of articles on mammalogy, ornithology, entomology, and botany, contributed by authors in various parts of Ontario, including papers by such prominent biologists as W.E. Saunders (supra) and

Charles William Nash on ornithology and William Brodie on entomology. Alice Hollingworth (1894) contributed an article on some uncommon plants – two ferns and two orchids – that she had found in Muskoka. Nevertheless, despite the relative strength of the Biological Section within the Institute, the viability of the Society as a separate organization seems to have been precarious from its inception. In March, 1894, Armstrong (summarized by Steiber & Karg, 1981) wrote to Frederick Vernon Coville, of the United States Department of Agriculture, that he hoped the Society could survive, pending government funding. *The Biological Review of Ontario* was received with hostility in Ottawa, where W.H. Harrington (1894b), editor of *The Ottawa Naturalist*, saw it as an unnecessary and wasteful rival of his own journal. Armstrong and his associates doubtless viewed the Ottawa Field-Naturalists' Club as a local organization, with its journal, as its name implied, being destined to concentrate on the natural history of the Ottawa district, whereas Harrington already envisioned a national role for the Ottawa Club's journal, which was expressed 25 years later in the name-change to *The Canadian Field-Naturalist*.[31] This reception presum-

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[29]Charles W. Armstrong, an associate member of the Canadian Institute, is to be distinguished from his father, Charles H. Armstrong (ca. 1843-1919), a full member (usually referred to simply as Charles Armstrong in the earlier volumes of the *Proceedings of the Canadian Institute*). The senior Armstrong served as the Institute's curator for several years. He gave a brief presentation, subsequently published, on an asclepiadaceous ornamental and a few unpublished presentations, mostly on microscopy but in one instance on Canadian ferns, but otherwise does not appear to have been active in botany.

[30]The continuity was such that Armstrong (in Wallace, 1949), reminiscing some 54 years later, essentially equated the Society with the Section, referring to the Society's quarterly as having been published by the Section.

[31]See Cody & Boivin (1954) for a history of *The Ottawa Naturalist* and *The Canadian Field-Naturalist*. Harrington presumably objected only to the journal, as the Ottawa club continued to hold all of its meetings and excursions in the Ottawa area, from which it drew nearly all of its membership.

ably diminished the Biological Society's prospects of government support and of province-wide membership. No second volume of the *Review* was published, and the Society itself soon disbanded.

Armstrong left Toronto for Vancouver ca. 1905, and worked as a commercial traveller in British Columbia. In 1929, he began collecting cacti and other succulents, especially *Sempervivum* species. Eventually he was able to give up his job as a salesman and establish a nursery specializing in cacti and succulents, which were shipped to customers throughout North America and overseas. Armstrong became active in the Cactus and Succulent Society of America shortly after its founding. The early volumes of its *Journal* contain many notes from him on cactus culture, especially on overwintering, along with pictures of Armstrong and his nursery. Articles on British Columbia species of *Talinum* and *Penstemon* appeared in the *Quarterly Bulletin of the Alpine Garden Society* (of Great Britain). (On Armstrong, see Anonymous, 1950b, 1951. The identity of Charles W. Armstrong of Toronto, ca. 1894, with Charles W. Armstrong, Vancouver horticulturist, is indicated in Wallace, 1949).

Alice Hollingworth, a corresponding member of the Biological Section, was one of the six children of John and Betty Hollingworth, who, in 1868, were among the first settlers in the Beatrice area following the opening of the Muskoka colonization road. Their farm, still in the family at the time of this writing, comprised Lot 4, Concession 1, Watt Township. Despite their isolation and the limited educational opportunities during the early years, the Hollingworths were remarkably active in scientific matters. Climatological data from Beatrice were sent by members of the family to the Canadian Meterological Office (later Atmospheric Environment Service) beginning in 1876 and continuing for over a century (Anonymous, 1975). As early as 1890, the members of the Biological Section of the Canadian Institute were sufficiently impressed by Alice Hollingworth's contributions to the knowledge of the Muskoka flora that they voted to present her with a copy of Gray's *Manual* in recognition thereof (Louise Herzberg, pers. comm., 1987, from Section minutes). Miss Hollingworth must certainly have appreciated receiving this expensive but virtually indispensible reference. During the 1891-1892 session, she read a paper, unfortunately not published, entitled "Scientific researches in rural districts." In 1896, according to the senior Armstrong (1896), "ninety-seven plants from the Northwest" were "given [to the Biological Section] by Alice Hollingworth"; the wording, however, does not definitely indicate that she collected these specimens in the field rather than acquiring them through exchange.

Later, Miss Hollingworth's membership in the Botanical Club of Canada further enhanced her opportunities in this field. This organization, founded by George Lawson (then at Dalhousie) in 1891, four years before his death, operated largely through the efforts of its General Secretary, Alexander Howard MacKay, Superintendent of Education for Nova Scotia. Although its objectives were diverse, its primary and only really successful function was the compilation of phenological data. Members were annually supplied with standard lists of events, mostly the first flowering of plant species but also some climatological and zoological phenomena, for which they supplied the dates on which these occurrences were observed in their respective areas. Alice Hollingworth was first listed as a member and a contributor of data from Beatrice in 1896. She continued to submit data through 1902, in the last year as Mrs. Frank E. Webster. Reports from Beatrice resumed in 1904, but from then until the dissolution of the Club

in 1910 were submitted by her father. (Data on Alice Hollingworth from census records, Watt Township, 1881 [microprint, Archives of Ontario]; MacKay, 1897, and other reports of the Botanical Club of Canada in *Proc. & Trans. Roy. Soc. Canada;* Gordon Hollingworth, in epist., 1984. On the Club, see also Boivin,

in 1910 were submitted by her father. (Data on Alice Hollingworth from census records, Watt Township, 1881 [microprint, Archives of Ontario]; MacKay, 1897, and other reports of the Botanical Club of Canada in Proc. & Trans. Roy. Soc. Canada; Gordon Hollingworth, in epist., 1984. On the Club, see also Boivin, 1891.) Both Charles W. Armstrong and Alice Hollingworth were listed in *The Naturalists' Directory* (Cassino, 1898, and other editions) as being interested in botany and having specimens available for exchange. Specimens of *Lycopodium digitatum* A. Br. (present identification) collected by Armstrong at Beatrice indicate that the Hollingworths were Armstrong's hosts on at least one trip to the Muskoka District.

Another venerable organization is the Hamilton Association for the Advancement of Literature, Science and Art (originally Hamilton Scientific Association), founded in 1857, mentioned above in connection with Alexander Logie and T.J.W. Burgess. This association, along with the Hamilton economy, lay in the doldrums from 1861 through 1870, but was reactivated in 1871, with sections established soon thereafter. The Biological Section, although never large, was a distinguished group, as it included, in its early years, Burgess, and, for a longer period, the renowned ornithologist Thomas McIlwraith. After the departure of Burgess for Verdun, the Hamilton Association's leading botanist was Andrew Alexander. Alexander, a native of Errol, Perthshire, Scotland, came to Hamilton in 1871 and, after employment for a time in a newspaper office, was a member of the customs-house staff for about 25 years. As well as being active in the Hamilton Association, he was the founding president of the Hamilton Horticultural Society, following its reorganization under the Agricultural Act of 1897, and authored several articles on ornamentals in *The Canadian Horticulturist* (J.M. Dickson, 1898; Anonymous 1914b,c; Johnson, 1950). Alexander contributed his own sizeable herbarium to the Hamilton Association, and arranged exchanges with other collectors, including William Scott and James White (infra).

Alexander did most of his botanical collecting near Hamilton and published on the flora of this area, but he also botanized in the vicinity of his summer home on Georgian Bay. In the latter area, his most frequent collecting sites were Islands Nos. 7, 8, and 9, Muskoka District,[32] northwest of Go Home, and the west side of Miner's Creek, opposite No. 9 Island on the mainland. Other specimens were obtained at nearby island and mainland points or were simply labelled "Georgian Bay Islands." Collection dates for Georgian Bay specimens range from 1887 through 1895. Because Peacock and nearby islands lie near the contact zone between the acidic rocks of the Precambrian Canadian Shield and

[32]No. 9 Island, the largest of this group, is now known as Peacock Island. No. 8, a short distance to the north, is now called Alexander Island, but it was evidently named long before Andrew Alexander acquired his summer home in the area (White, 1913). Alexander and Wawataysee islands appear to have been confused in the past; the real Wawataysee Island is north of Alexander, separated by ca. 220 m. No. 7, a small island immediately northwest of Alexander Island, has not been renamed. (From the Secretariat, Geographical Names, Energy, Mines and Resources Canada, communicated by A. Rayburn, in epist., 1985, and topographic maps.)

the calcareous sedimentary rocks of Paleozoic age to the southwest, some of Alexander's specimens from this area represent species near the limits of their ranges. There have been few other botanical collections from the Georgian Bay islands until recently; therefore Alexander's specimens have remained especially significant.

The Entomological Society of Ontario,[33] in earlier and later years, was what its name implies, but from 1890 to 1906 it functioned primarily as a "London Academy of Science," with its meetings consistently being held at its London headquarters and its activities encompassing other branches of the natural sciences in addition to entomology.[34] (On the early history of the Entomological Society of Ontario, see Baker, 1929, and Judd, 1979.) In addition to W.E. Saunders (supra), several other members of this society made contributions to floristics in the Lake Huron basin during the 1890s, as noted by Judd (1979), although most of their field work was concentrated in the London area, outside this watershed. Foremost among these was John Dearness, who was elected chairman of the Botanical Section when it was founded in 1890. Dearness, who had long been interested in the native flora, was at that time teaching biology in the Faculty of Medicine, University of Western Ontario, and serving as Inspector of Schools for East Middlesex; previously he had been a teacher and principal of the schools of Lucan and Strathroy. When the London Normal School was founded in 1899, he became its vice-principal; in 1918, he became principal. Through extramural studies, he qualified for the degrees of B.A. and M.A. from the University of Western Ontario in 1902 and 1903, respectively. Dearness's greatest achievements were in mycology, in which field he published many scholarly papers, including a series entitled "New species of Canadian fungi," on which he collaborated with Job Bicknell Ellis of Newfield, New Jersey. He also published significant contributions in ornithology, history, and the teaching of biology, as well as in floristics. Dearness "scoured the fields, roadsides, and swamps for specimens" of flowering plants and fungi, and developed "an incomparable knowledge of the plants of souwestern Ontario" (Judd, 1979). In June, 1891, Dearness and J.H. Bowman (infra) reported to the Botanical Section on their floristic study of the Drowned Lands of the Aux Sables [Ausable] River valley, where they found the nationally rare *Isopyrum biternatum* (Raf.) Torr. & Gray and *Buchnera americana* L.[35] The minutes of the

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[33]This organization was founded in 1863 as the Entomological Society of Canada. In 1871, it was incorporated as the Entomological Society of Ontario, the new name reflecting provincial support as well as the new meaning of "Canada" following Confederation. In 1950, a new Entomological Society of Canada was founded, to "link" the Entomological Society of Ontario and several other regional societies that had formed in the interim.

[34]During this period and for some time thereafter, there was a Toronto Branch of the Entomological Society of Ontario. Its functions were strictly entomological, since the Canadian Institute with its Biological Section and Botanical Sub-section existed at the same time. There was also a Montréal Branch.

[35]The Ausable River itself had been diverted from this area 18 years earlier. The Drowned Lands were located west of McInnes, where Parkhill Creek enters the old course of the Ausable. Label data (OAC) indicate that the *Isopyrum* specimen was collected at the "flats of Mud Creek, Parkhill," in April, 1891.

Botanical Section (Judd, 1969) and herbarium records in CAN, DAO, and OAC indicate that Dearness botanized at Parkhill, Port Franks, and Grand Bend in subsequent years. (On Dearness, see Tamblyn, 1956; Talman, 1957; Judd, 1979; and references cited therein.)

Dearness's associate in the Drowned Lands study, James Henry Bowman, was a graduate of the Ontario College of Pharmacy and had been employed by William Saunders (father of W.E. Saunders, supra) in London. In 1881, he became Professor of Theoretical Chemistry at the newly founded London Medical College (later the Faculty of Medicine, University of Western Ontario). In the Entomological Society, he was "the leading figure in the Microscopical Section" as well as an enthusiastic member of the Botanical Section. He was regarded as being "one of the best-informed members on the identification of plants of southwestern Ontario" (Judd, 1979). He also collected plants in more distant parts of the Lake Huron watershed. His most significant collections were made in the summer of 1894 at Bala, on Lake Muskoka, where he found a number of uncommon species, including several from boggy and aquatic habitats. Among those exhibited at a meeting of the Botanical Section were *Xyria montana* Ries (as *X. flexuosa* Muhl. ex Ell. var. *pusilla* A. Gray) and *Utricularia resupinata* B.D. Greene ex Bigelow (Judd, 1969). Bowman also visited Owen Sound in 1891, as indicated by a specimen of *Polystichum lonchitis* in OAC.

Another leading member of the Botanical Section was William Thomas MacClement, who contributed specimens from Port Franks in 1895. MacClement, a graduate of Queen's University (B.A. 1888, M.A. 1889), was then a teacher at the London Collegiate Institute, to which he had come after teaching at schools in Sydenham, Kingston, and Ingersoll. Later, he obtained his doctorate in biology at the Armour Institute of Technology in Chicago and became a faculty member at Queen's University. Probably MacClement's proudest achievement at Queen's was his reestablishment of the summer school, enabling teachers to work toward degrees without interrupting their careers. He was also active in horticulture, providing advice on garden pest and disease problems for the public, and served as chairman of the Ontario Horticultural Association committee that selected *Trillium grandiflorum* (Michx.) Salisb. for sponsorship as the floral emblem of Ontario (Pringle, 1984). (On MacClement, see Anonymous, 1938b, and Beschel, 1966.)

John Arthur Balkwill was a London bookkeeper, best known as an amateur entomologist and horticulturist (Anonymous, 1908; Bethune, 1908) and for his contributions to studies of *Crataegus* in the London area by Charles Sprague Sargent, who (1908) named a hawthorn for him, now known as *C. scabrida* Sarg. var. *balkwillii* (Sarg.) Phipps. Balkwill was recorded as having observed *Buchnera americana* and certain other species at Port Franks, and as having collected *Kalmia polifolia* Wang. (as *K. glauca* Ait.) while visiting at Wingham in 1891 (Judd, 1969, 1979). Otherwise, his plant collecting seems to have been done outside the geographic area and time period being considered here.

According to Edwards (1893), at least one specimen in the Entomological Society's herbarium, *Megalodonta beckii* (Torr. ex Spreng.) Greene (as *Bidens beckii* Torr. ex Spreng.) from Port Franks, was contributed in 1892 by a "Mr. Stephenson." This was presumably Hugh Allan Stevenson (1870-1942), then a student, later an anaesthesiologist (M.D. and C.M. Trinity Medical College,

affiliated with the University of Toronto, 1895) practicing in London. Stevenson is best known as having been a flamboyant and bellicose politician, who served as mayor of London and as an Ontario Labour Party member of the Legislative Assembly. His brother, William John Stevenson (1872-1947), later a surgeon (M.D. and C.M. Trinity, 1896), also participated in sections of the Entomological Society. The *Megalodonta* specimen was not found at OAC, nor were any specimens from the Lake Huron area collected by either of the Stevensons encountered in the present study. (On both Stevensons, see Anonymous, n.d., and alumni records, University of Toronto; on Dr. Hugh A. Stevenson, see also Anonymous, 1942.)

Yet another member of this coterie was Ernest Edwin Gibbs (1870-1959), who recorded some plants observed near Forest, where he taught school from 1891 to 1895, before moving to London, but who apparently preserved no specimens from this area. (On Gibbs, see Judd, 1979.)

In addition to a collection or collections by Bowman, at least one additional specimen, a hart's-tongue fern from Owen Sound in 1891, was received from William Henry Jenkins, science master at the Owen Sound Collegiate Institute. Jenkins, a native of Madoc, had gone to Owen Sound after receiving his B.A. from the University of Toronto in 1890, and became principal of the Collegiate Institute in 1893. Owen Sound evidently took great pride in having a person of Jenkins's qualifications on the faculty, and regularly accorded him the title of "Professor." In 1902, he left Owen Sound to become registrar of the Ontario Department of Education, and he held this position until tuberculosis forced his retirement in 1906. (Anonymous, 1907a; Croft, 1980). Although Jenkins did little collecting of specimens, he evidently established a reputation as being well informed about the ferns of the Owen Sound area, as indicated by the acknowledgment given him in a study of the hart's-tongue fern by the noted United States pteridologist William Ralph Maxon (see Soper, 1954).

The Botanical Section of the Entomological Society of Ontario had an herbarium of native plant species at its London headquarters, established in 1891 and initially curated by J.A. Balkwill. This herbarium acquired over 300 specimens in its first year, largely from gifts by J.A. Morton and James White (infra) (Althouse, 1892). Specimens documenting some of the reports by Dearness, Bowman, MacClement, and Balkwill were placed in this herbarium. Along with with the Society's library, the herbarium was given to the Ontario Agricultural College (now part of the University of Guelph) when the Society moved its headquarters there in 1906. However, by no means all of the reports by these naturalists in the minutes of the Botanical Section (Judd, 1969) are documented by specimens at OAC. Many reports were made before the herbarium was begun. Some post-1890 reports may have been sight records only, and some of the specimens "examined" may never have been prepared for the herbarium. Nevertheless, in view of the effort expended on developing the herbarium, and the number of gifts recorded (Judd, 1969), the present number of specimens from the Society's herbarium now at OAC seems small, suggesting that some specimens may otherwise have been disposed of, or may have been destroyed, before the transfer was made. Dearness sent specimens to Macoun, these now being at CAN, and developed a large private herbarium, now mostly at MTJB in part at DAO, to which Boivin (1980) has suggested part of the Botanical Section's herbarium might have been transferred after the Section became inactive. Other specimens collected by members of the Section were sent to Burgess and are now at MTMG. However, records cited by Soper (1956, 1962) indicate that some of the reports in the minutes lack documentation in any of these herbaria.

In June, 1895, the Botanical Section was host to Rev. Dr. Robert Campbell, pastor of St. Gabriel Street Presbyterian Church in Montréal and a former president of the Natural History Society of Montréal, when the General Assemby of his church, of which he was clerk, met in London. Campbell, an 1858 graduate of Queen's University, had already published papers on the flora of Montréal Island and Cap-a-l'Aigle, Québec, and later published several popular articles on Canadian plants. After the meeting in London, Campbell spent a few days' holiday in Lambton County, botanizing around Forest, Kettle Point, and Stoney Point. Later that year, Campbell published a report on noteworthy plant records from this area and elsewhere (Campbell, 1895; see also Judd, 1969). He was especially interested in ferns, and addressed the Ottawa Field-Naturalists' Club on this subject in 1901 (using lantern slides). Over the years, Campbell collected a large number of botanical specimens, which he donated in 1911 to the Natural History Society of Montréal. When this organization disbanded ca. 1927, its herbarium was given to McGill University, but at this time the University's herbarium was inactive. By the time the Natural History Society's herbarium was integrated with that of the University some 30 years later, some of the specimens had been lost to decay (Milne, 1969; Boivin, 1980); this may account for the absence of specimens documenting some of Campbell's published reports. (On Campbell, see Morgan, 1898, and Anonymous, 1922a.)[36]

Although he lived in Wingham, 114 km by road north of London, James Alexander Morton[37] was well known to the Botanical Section of the Entomological Society through gifts of specimens. The Wingham area is characterized by fens, eskers, and other rich or unusual plant habitats. However, during the nineteenth century and the early years of the twentieth century, Morton was the only person who collected significant numbers of herbarium specimens in the area, in contrast to the many plant collectors who were attracted to the shores of Lake Huron to the north and west and to the Niagara Escarpment to the east. Morton began collecting botanical specimens shortly after establishing his law practice in Wingham in 1876, and quickly developed an excellent knowledge of the local flora. Despite his relative isolation, he established correspondence with many professional and amateur botanists in Ontario and elsewhere, thereby adding to his herbarium through exchange. One of Morton's most noteworthy discoveries, credited to him in standard floras, was an adventive parasitic species,

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[36] Undated Campbell collections at MTMG represent a summer's botanizing at Forest, the Ausable River, Wiarton, Owen Sound, and other points near Lake Huron. However, comparison of Campbell's handwriting on these specimens with that on dated specimens, and correlation of the plant names used with those in the successive editions of *Gray's Manual*, indicate that these specimens were probably collected ca. 1909 or 1910.

[37] Morton's first name incorrectly appears as "Jasi" in several references; this evidently proliferated from the abbreviation "Jas." with a poorly placed period, signed when Morton registered at the Osgood Hall Law School (Judd, 1979). Morton should not be confused with two contemporaries whose writings may sometimes be identified by the initials J.A.M., namely John Alston Moffat (1825-1904), the Entomological Society's curator and librarian, author of many papers on natural history, mostly in the Society's publications, and John Alfred Morden (1859-1937), a London amateur naturalist who published several notes, mostly on birds.

Orobanche purpurea Jacq., in a field at Wingham in 1895, the only time this species has been found in North America. Very much the Renaissance man – he taught music and founded an orchestra, studied and promoted Esperanto, was an expert whist player, and served as mayor and magistrate – Morton is of further interest to the history of plant science in Ontario as a horticulturist and pioneer plant breeder, working with sweet corn and *Gladiolus.*[38] Eventually, probably feeling that he had accomplished all he could in plant collecting, he relinquished this avocation and donated his herbarium to the University of Western Ontario (UWO). By this time, he had accumulated ca. 4000 specimens from the Wingham area, and ca. 1900 more from other parts of southern Ontario through his own collecting and exchanges. Earlier, he had made sizeable gifts of specimens to the herbaria of the Botanical Section of the Entomological Society of Ontario and Michigan State University (Judd, 1879; data on collections from Vegter, 1976, and Boivin, 1980).

Boivin (1980) expressed concern that the replacement of Morton's original labels by W.G. Colgrove at UWO during the 1930s had been accompanied by "editing" of locality and habitat data and the substitution of "bookish statements." However, Morton's own labels, which are still present on specimens sent to Amos Arthur Heller (seen at F; possibly present in greater numbers at BKL, which acquired Heller's herbarium), indicate that no data were lost. These labels were printed with "Wingham, Ont. Collector, J.A. Morton"; the species name and the date were inserted with a rubber stamp, apparently with moveable type. Other data were generally absent. Another specimen, from the herbarium of Fayette Frederick Forbes, now at GH, also bears an original label with identical printed data. All that is added is the handwritten "*Tofieldia glutinosa* Willd. [sic] Bunch Flower fam.," a number, and two dates in 1892. *Tofieldia glutinosa* (Michx.) Pers., a characteristic species of interdunal shoreline habitats, was not likely collected at Wingham, although it does occur in a few inland fens in southern Ontario. Like many other amateur collectors of his time, Morton evidently had limited appreciation of locality data, and, from the known distribution of some of the species collected by Morton, it appears that he used the "Wingham" labels, unsupplemented, too freely (J.B. Phipps, pers. comm., 1981; see also, e.g., comments on *Amelanchier bartramiana* Tausch) Roem. by Soper & Heimburger, 1892). Consequently, one of Morton's most significant discoveries, the first record of the provincially rare grass *Melica smithii* (Porter ex A. Gray) Vasey for eastern Canada, collected in 1892, was viewed with skepticism until the species was rediscovered in Huron County in 1966 (Dore &

[38]One thing Morton evidently did not do, however, was travel to Alaska. Vegter (1976) stated that there were in UWO ca. 4000 specimens collected by Morton in Alaska beginning about 1891, the dates overlapping with those given for his collecting in Ontario. Expeditions to Alaska at that early date could hardly have been overlooked by Judd's (1979) sources, and according to Dr. J.B. Phipps (pers. comm., 1981), there are no J.A. Morton collections from Alaska at UWO.

McNeill, 1980). (*Melica smithii* had been rediscovered in Ontario in 1908, but on the Bruce Peninsula rather than in Huron County.)

The label of a specimen of the hart's-tongue fern at HNH, from the herbarium of Ferdinand Blanchard, bears the printed heading "Ex herb. J.A. Morton," with all other data, including the locality "Owen Sound," being handwritten. This, however, was probably not one of Morton's own labels; more likely it was printed for HNH, as it resembles other labels at that herbarium and the handwriting appears to be that of Henry Griswold Jesup, curator at the time of Blanchard's death in 1892. Collection of this specimen in 1891 was credited to "Mrs. Macdonald." Without initials or other clues, her identity cannot definitely be established. Presumably she was an acquaintance who knew of Morton's herbarium and though that he would appreciate fronds of a fern pointed out to her as a rarity.

To his fellow naturalists, Morton was a gracious host, eager to encourage beginners and to take visitors to his favourite collecting localities. J.A. Balkwill's visit has been noted above. Frederick Arnold Clarkson was introduced to botany by Morton while Clarkson was a student at Mitchell and Seaforth, and the two continued to collect plants in the Wingham area during the 1890s, when Clarkson was a teacher in a nearby rural school. Clarkson subsequently graduated from the University of Toronto Faculty of Medicine (M.B. 1901), did further study in internal medicine and pathology in London, England, and Vienna, and became professor of clinical medicine at the University of Toronto. He was recognized as a pioneer in radium therapy for cancer. He remained interested in natural history, and contributed herbarium specimens, including some from his early botanizing around Wingham, to the herbarium of Absalom Cosens (infra), now at TRT. (On Clarkson, see Anonymous, 1960, 1963, and Judd, 1979.)

Morton and Dearness were evidently "the key instigators" in the founding of The Canadian Botanists' Correspondence Association in 1891. Although it attracted the attention of such prominent persons as Fowler and Macoun, it never really became a functioning organization, and "it does not seem to have accomplished anything significant." Morton may also be assumed to have been the founder of a similarly ephemeral, affiliated botanical club in Wingham (Boivin, 1987). He is, however, the only resident of Wingham whose botanical specimens are known to be extant.

Another naturalists' organization that came into being in the 1890s was the East Elgin Botanical Association, which met at Aylmer, ca. 34 km southeast of London. It was founded in 1899 and held meetings for only a few months, because several of its key members, most significantly Robert Thomas Anderson, left the area. Anderson collected specimens primarily in Elgin County, i.e. outside the area covered in this study, but also in various other parts of southern Ontario, including the vicinity of Sarnia, where he found the nationally rare *Swertia carolinensis* (Walt.) Kuntze in 1896, and the Muskoka Lakes area in 1898. Specimens collected by Anderson while he lived at Aylmer date from 1894, when his family moved to Aylmer from Barrie, through 1899. In 1900, he became a student at Victoria University in Toronto. There he "was particularly distinguished for good work in practical geology," but remained interested in other natural sciences as well. At the time of his death in 1903, attributed to a heart attack while swimming, he was assistant to Dr. Benjamin Arthur

Bensley, a University of Toronto zoologist, at the biological station at Go Home Bay.[39] He had assembled highly regarded collections of minerals, insects, birds, insects and eggs, as well as plants, and the archaeological specimens he had discovered in eastern Elgin County were much esteemed by the curator of the Provincial Museum, to which institution he presented them in 1902. (On Anderson and the East Elgin Botanical Association, see Anonymous, 1903a,b, 1904, and Stewart, 1977, 1978.)

The East Elgin Botanical Association established an herbarium (since destroyed) at Aylmer Collegiate Institute and an "exchange bureau," active through 1902, which distributed specimens to a number of institutions in North America and Europe. Also, the *Botaniker Adressbuch,* a world directory of botanists, listed Anderson in its 1902 edition as a collector of phanerogamous plants, with specimens available for exchange. His own herbarium was presented to Victoria University after his death, and subsequently incorporated in TRT.

Following the demise of the East Elgin Botanical Association, its exchange program was taken over by one of the members, George Lewis Fisher, who may already have been involved in such activities before the Association was founded. Fisher was a resident of St. Thomas, who taught music there and occasionally also at Aylmer until he moved to Texas in 1911. Initially, he designated his exchange program the Canadian Botanical Exchange Bureau; later, in Houston, it became the American Botanical Exchange. Tens of thousands of specimens collected by Fisher and his clientele were distributed to individuals and institutions throughout North America and Europe. (Wingham and Seaforth newspapers found in his former residence at St. Thomas, cut to the size he used for specimens, suggest that J.A. Morton [supra] and Absalom Cosens [infra] were among those with whom Fisher traded specimens.) He collected and exchanged vascular plants, bryophytes, and lichens, but was especially interested in ferns and "fern-allies." Most of Fisher's own collecting was done outside the geographic area and time period covered here, but citations (by Wilce, 1965) of a hybrid clubmoss, *Lycopodium* X *habereri* House (pro sp.), indicate that he did some botanizing at Dorset in the Muskoka District in 1898. (On Fisher and the Canadian Botanical Exchange Bureau, see Stewart, 1983, and numerous publications cited therein, especially Shinners, 1954.)

At Queen's University, the revival of botany upon the appointment of James Fowler (1829-1923) as lecturer in the natural sciences in 1880 included the establishment of the University's herbarium, to which Fowler and several of his colleagues and students contributed. William Nicol,[40] one of Fowler's students (B.A. Queen's, 1883), returned to Queen's for his master's degree after teaching high school at Guelph. Upon receiving his degree in 1889, Nicol

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[39]This biological station was founded in 1898 by the Madawaska Club, an organization of University of Toronto and Victoria University faculty members (Coombe, 1976). In 1901, it was superseded by a federal government facility (Wright, 1903; Bensley, 1912), but in practice it remained closely tied to the University of Toronto. This station had its own herbarium (Boivin, 1980), but this evidently came into being as a result of floristic studies of the area begun by Archibald Gowanlock Huntsman (1883-1973) in 1904 and continued the following year. It is, therefore, outside the scope of the present paper. When the biological station was discontinued in 1914, the herbarium was incorporated into TRT.

went to Heidelberg, Germany, for a year's further graduate study in mineralogy, with the understanding that he would fill the new faculty position in mineralogy to be created at Queen's. Nicol taught at Queen's and the affiliated School of Mining for 25 years, and donated the funds for a new building, now called Nicol Hall, for the geological sciences and School of Mining. He published a few papers on geology and mineralogy, but his greatest professional enthusiasm, except for teaching, was for collecting, in particular toward developing a large and diverse collection of mineral specimens for the University (Anonymous, 1924a,b,; Spencer, 1924). This enthusiasm that provided Queen's with its esteemed mineral collection also benefitted the herbarium, to the extent that Nicol was listed by Beschel (1966) among the most important of the early contributors of specimens. Most of Nicol's botanizing was done in the immediate vicinity of Kingston, constituting, according to Beschel, "a thorough plant survey" of the area, especially of Cartwright's Point and Cedar Island. Other Ontario localities, including Owen Sound, visited in June, 1889, just before he went to Heidelberg, were the source of lesser numbers of Nicol's specimens.

Fowler's undergraduate students also contributed some herbarium specimens of interest in the present context. Specimens from the vicinity of Lake Rosseau, Muskoka District, in 1888, as well as from other parts of Ontario, were contributed by Richard Lees. Lees had begun his teaching career in 1881 at Norwood, and had subsequently held positions as principal at the Victoria County Model School in Lindsay and as science master at Brampton Collegiate Institute. Meanwhile, he was enrolled as an extramural student at Queen's University, from which he received his bachelor's degree in 1883 and his master's in 1891. It was while he was at Brampton, from 1887 to 1893, that Lees was most active in his studies of mosses and vascular plants, frequently accompanied on his field trips by James White and T.L. Walker (infra), sharing with the latter an interest in mineralogy as well as botany (Crowder, 1974; Stewart, 1979). From 1893 to 1905, Lees taught at the St. Thomas Collegiate Institute and was active in the East Elgin Botanical Association and in the Microscopical and Botanical sections of the Entomological Society. During this time he became especially interested in algae; he took a summer course on marine algae at Woods Hole, Massachusetts, and spent ten years working on a thesis, accompanied by numerous specimens and drawings, on Ontario fresh-water algae. Subsequently, however, feeling that he had unfairly been denied a doctorate from Queen's, he became disenchanted with the sciences. After his move to Peterborough in 1905, where be became public school inspector, "teaching and teaching methods were his hobby as well as his life work" and were the subject of a number of articles, both professional and popular. He was one of the first educators in Ontario to become interested in consolidated schools, and was also a leader in continuing (adult) education (Anonymous, 1938c; Stewart, 1979).

Several other teachers in the primary and secondary schools of Ontario became notable botanical collectors during the last twenty years of the nineteenth century, as Spotton and Buchan (supra) had been in earlier decades. Some were

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[40]William Nicol (1861-1924) of Queen's University is to be distinguished from Ontario Attorney General William Folger Nickle (1869-1957), who was chairman of the Queen's University board of trustees in the 1920s (both known as "Billy" on the Queen's campus); William Bulmer Nicol (1812-1886), the first professor of materia medica in the medical school of the University of King's College in Toronto; and William Nicol (1768-1851) of Edinburgh, Scotland, author on fossil conifers.

primarily concerned with providing teaching herbaria for use in their respective schools; others accumulated large personal herbaria as an avocation. One of these teachers was Absalom Cosens, whose plant specimens from the vicinity of Seaforth and Clinton were so numerous that, as late as 1945, his and J.A. Morton's collections were cited as sufficing well to represent the flora of Huron County in a phytogeographical discussion by Montgomery. Cosens' botanical collecting began as least as early as 1890, when he found the nationally rare *Erigenia bulbosa* (Michx.) Nùtt. at Seaforth, and continued well into the twentieth century.[41]

Absalom Cosens, upon receiving his master's degree from the University of Toronto in 1904. (Photograph courtesy of Miss Edith Cosens.)

[41]The note "sent by W. Cosens" on a specimen of *Cacalia plantaginea* from Clinton at TRT was doubtless based on an "A" not closed at the top, characteristic of Cosens' signature. Apparent replicates of the same collection were attributed, by other recipients, to "A. Cosens."

Cosens was born near Seaforth in Tuckersmith Township, and taught at a nearby elementary school before enrolling at the University of Toronto, from which he graduated in 1896. He then attended the Ontario College of Education, and in 1897 began his career as a science teacher at Brampton Collegiate Institute. In 1904, he became head science master at Parkdale Collegiate Institute in Toronto, which position he held until Parkinson's disease dictated his retirement in 1928. During this time, he continued his studies at the University of Toronto, receiving his master's degree in 1904. In 1913, he became the first person to receive a doctorate in botany from the University of Toronto (Forward, 1977), with a dissertation on galls.[42] In collaboration with Thomas Jayne Ivey (1874-1927), science master at Harbord Collegiate Institute, Toronto, he authored *Botany for High Schools*, published in 1933, which became widely used as a textbook in Canada. Cosens and Ivey also prepared a revised edition of H.B. Spotton's *Wild Plants of Canada*, with a new key to the families and many added species (Anonymous, 1938a; E.H. Cosens, 1985). Cosens continued to develop his herbarium (now at TRT) as long as his health permitted, collecting specimens in much of southern Ontario, as indicated by label data and by localities including Owen Sound and Woodford that were mentioned in his paper on the habitats of Ontario ferns (A. Cosens, 1913).

Cosens was also actively interested in entomology, frequently addressing the Toronto Branch of the Entomological Society of Ontario, and for several years he reported on the "insects of the year" for the Toronto district in the *Annual Reports of the Entomological Society.* He participated in the organizational meeting of the Toronto Field Naturalists in 1923 (Talvila, 1974), but, because of his failing health, he was not long active in this organization.

Seaforth in 1897 was also a botanizing site for another teacher, William Scott,[43] whose specimens obtained on this occasion included the nationally rare *Arisaema dracontium* (L.) Schott. Scott was an especially active collector of plant specimens across Canada. A native of Ashkirk in present-day Selkirkshire, Scotland, Scott had come to Bowmanville, Canada West, as a child and had begun his teaching career in the schools of Durham County at the age of 17. Later, he attended the Toronto Normal School and became head master of the Boys' Model School in Toronto. While head master he also studied at the University of Toronto, from which he graduated in 1876. In 1882, he became mathematics master at the Ottawa Normal School. Science was added to his responsibilities in 1889. He moved to a similar position at the Toronto Normal School in 1894, and became its principal four years later. While in Ottawa, Scott served for two years as botanical editor for *The Ottawa Naturalist*, and in Toronto, he was active in the Canadian Institute and served as its secretary. He was co-author of two arithmetic textbooks. (On Scott, see Fraser, 1907; Morgan, 1912; Anonymous, 1920; and Wallace, 1949.)

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[42]Cosens' dissertation is a bibliographic oddity for North America, in that it was submitted as a published dissertation, following the custom at universities in some European countries.

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[43]William Scott (1845-1920), teacher in the normal schools, is to be distinguished from William Louis Scott (1862-1947), Ottawa lawyer active in issues affecting young people. Both were members of the Ottawa Field-Naturalists' Club during the 1890s, the latter's contributions being mostly ornithological, and both served as the Club's librarian.

James White[44] was a native of Ireland, but he came to Canada in early childhood, and later became a schoolteacher, briefly at Carthage [now Britton], Dorking, Heidelberg, and Paisley, Ontario, then for 32 years at Edmonton [Snelgrove after 1895; now part of Brampton]. Beginning about 1882, White developed an herbarium of over 5,000 specimens, through his own collecting and through exchanges. In Canada, the Botanical Section of the Entomological Society of Ontario and Andrew Alexander (supra), on behalf of the Hamilton Association, were among the principal recipients of White's specimens; other correspondents included John Macoun, J.M. Macoun, and William Scott (supra). White also acquired specimens from Alvah Augustus Eaton, John Bernhard Leiberg, Conway MacMillan, Cyrus Guernsey Pringle, John Herman Sandberg, Charles Fay Wheeler, and others in the United States, and contributed specimens to their herbaria or to those of the universities with which they were associated. Other specimens were sold to the Paris and Budapest herbaria. Moss specimens were sent to James Fowler at Queen's University and to Macoun.

White was primarily interested in the flora of the County [now Regional Municipality] of Peel, on which he published several family-by-family accounts in *The Ontario Natural Science Bulletin*. It is illustrative to the expertise to which White attained that these included lists of the Gramineae and Cyperaceae. White did, however, botanize in other parts of southern Ontario. Localities in the Lake Huron watershed at which he collected during the 1890s include Port Sandfield and Gravenhurst in Muskoka District, Cape Croker on the Bruce Peninsula, and Barrie. *Zigadenus glaucus* (Nutt.) Nutt. from fens just west of Barrie was an "especially interesting" discovery (A.A. Reznicek, in epist., 1986), since this species in Ontario is largely confined to the shores of Lake Huron exclusive of Georgian Bay. In September 1893, White was at Spanish Mills, on Aird Island in the North Channel of Lake Huron, from which site one of his moss specimens became a syntype of the name *Brachythecium caver-*

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[44]Four individuals named J. White were active, to various degrees, in the plant sciences in Ontario around the turn of the century. Barnhart (1965), Crowder (1974), and others have confused James White (1848-1931), the Snelgrove schoolteacher, with James White (1863-1928), a geographer employed by the Geological Survey of Canada and the Department of the Interior. The latter James White contributed material on the distribution of forest types and tree species for the first edition of the *Atlas of Canada,* but was not a collector of herbarium specimens nor otherwise an author of botanical works. James Herbert White (1875-1957), son of James White of Snelgrove, was a member of the Faculty of Forestry, University of Toronto, from 1909 to 1946. He established the herbarium of the Faculty of Forestry, subsequently incorporated into TRT (Boivin, 1980), but a large portion of the specimens in this herbarium were collected by his father. Dr. John Edward White (1848-1894), a Toronto physician and one of the founders of the Ontario Medical Association, contributed live plants of native species to the Botanic Garden of the Dominion Experimental Farm in Ottawa in 1892 (Fletcher, in Scott, 1892). He was also a member of The Canadian Botanists' Correspondence Association. Less likely to be confused, and therefore not further investigated in the present study, are a Mrs. J.E. White of Toronto, presumably the widow of Dr. White, who collected some specimens in the Toronto area from 1899 to 1902 (Boivin, 1987); James F. White, LL.D., principal of the Ottawa Normal School, who was an honorary member of the Ottawa Field-Naturalists' Club from 1903 through 1913, but who is not known to have collected plant specimens; and Mrs. James S. White of Lion's Head, who collected ferns there in 1953 (TRT).

nosum Kindb., now regarded as a taxonomic synonym of *B. rutabulum* Hedw.) B.S.P. Other notable discoveries by White included *Phyllitis scolopendrium* var. *americana* and *Polystichum lonchitis* at Woodford in 1898. (On White, see Anonymous, 1922d, which contains an extensive, but at some points exaggerated, account of his herbarium; also Anonymous, 1931.)

On some of his moss forays in Peel County, White was accompanied by Thomas Leonard Walker of the Geological Survey of Canada. Walker had received his bachelor's and master's degrees in geology from Queen's University, having studied under Robert Bell. His botanical collections were confined almost entirely to bryophytes, which he liked because they were compact and therefore easy to carry in the field. Of interest in the present context are his specimens from the summer of 1893, when he was doing a study of mines for the Geological Survey and working on his doctoral dissertation on the geology of the Sudbury area. These mosses were obtained at Parry Sound, the Spanish River, and several localities in the vicinity of Sudbury (Crowder, 1974). After Walker received his doctorate from the university at Leipzig, he did some of his most significant botanical collecting while assistant superintendent of the Geological Survey of India. In 1902, he joined the faculty of the University of Toronto, where he became professor of mineralogy and petrography. Concurrently, he was director of the Royal Ontario Museum of Mineralogy (Morgan, 1912; Parsons, 1943).

James Andrew Giffin established a small herbarium of fern specimens at St. Catharines Collegiate Institute in 1899, consisting largely of his collections from various points around Lake Muskoka that summer. Giffin was the only collector of specimens pertinent to the present study who prepared his labels with a typewriter. He received his B.A. from the University of Toronto in 1888, and taught at Clinton before coming to St. Catharines to teach biology in 1892. The High School Inspector's report noted that he used Charles Edwin Bessey's *Botany for High Schools and Colleges*. Giffin had been admitted to medical school in Toronto in 1887, but apparently never proceeded with medical studies. He did, however, find time to study for his law degree, which he received in 1895. He continued to teach biology at St. Catharines at least until 1906, but eventually he did follow through on one of his impulses to change careers, although not to one of the professions; he left both teaching and Canada and became a fruit grower near Redford, Michigan, west of Detroit. Giffin was also a poet, and published a volume of his poems, and contributed others to an anthology, in the 1930s. Some titles indicate a lasting interest in nature, but this interest does not appear to have been manifested in any further collecting of biological specimens.[45] (Information on Giffin has been compiled from the University of Toronto *Calendar* and alumni records; the High School Inspector's Annual Report, 1899, for St. Catharines Collegiate Institute [Archives of Ontario]; and, for dates of birth and of residence in St. Catharines, respectively, *The National Union Catalog* and Mrs. Sheila Wilson, in epist., 1984.)

The earliest specimens collected for the purpose of developing an herbarium at McMaster University, then in Toronto, were those collected by Arthur Brown Willmott following his appointment as professor of natural science in 1892. Willmott had received two bachelor's degrees from the University of Toronto and his master's from Harvard, and had taught at Antioch College in Ohio before returning to Canada. His interests were primarily in geology, and after leaving McMaster in 1900, he was employed in private industry as a geologist and mining engineer (Anonymous, 1914a; Wallace, 1949). Some of Will-

mott's specimens were collected around Toronto, but others, perhaps a greater number, were obtained on trips outside this area. The first of these trips, and the only one pertinent to the present study, was to Jackson's Point, on the south shore of Lake Simcoe, in August, 1892.

From its early manifestations in the first local scientific societies and the short-lived Botanical Society of Canada, botany as a hobby, or at least the development of private herbaria, had greatly increased in popularity by 1890. This growth was paralleled in many other avocations, as the North American populace became better educated and had more leisure time. Such persons as Thomas Millman and J.A. Morton (supra), who accumulated large herbaria but published nothing on botany, exemplify the fad of collecting that proliferated during the latter part of the nineteenth century. Herbaria were amassed in much the same spirit in which later collectors acquired baseball cards or china plates, rather than as scientific resources or documentation. Correspondence from the period (e.g., Mrs. Roy's letters to Bebb) often indicates a collector's desire to "have" one good specimen each of as many species as possible, or of all of the species in some group, from any source, after which acquisition no further specimens of the respective species would be desired.

In the United States and the United Kingdom, a small proportion but nevertheless a significant number of these amateurs progressed beyond mere collecting to make major contributions to systematic botany. In Canada, however, only a few, like Logie and Campbell, acquired sufficient expertise at plant identification and awareness of plant-distribution patterns to enable or motivate them to make even minor contributions to the literature of Canadian floristics. Moreover, relatively few of their herbaria were of any value to phytogeography or taxonomy, as they often lacked adequate locality and other data. The more significant effects of the collecting fad may have been negative, in that some collectors derived a feeling akin to pride of workmanship from "getting" every last plant in a population of a rare species, the better to supply the desiderata of their many correspondents, who in turn often requested duplicates for their correspondents. Nevertheless, some well-labeled private herbaria, especially if not restricted to showy species or well-known rarities, did contribute significant records for Macoun and other botanists of the time, when brought to their attention. Some that were ultimately donated to institutional herbaria continue to be of value to taxonomists and phytogeographers. Also, some individuals, even though they only collected a small number of specimens, were the only persons for several decades to do any botanizing in their parts of the Lake Huron basin.

One of the collectors who did make a notable contribution to Ontario floristics during the 1890s was William Herriot, whom Groh (1938; in part a paraphrase of Kerr, 1931) described as "a born naturalist, [whose] quick eye detected anything out of the ordinary, and enabled him to add not a few records to the Canadian flora, along with a most creditable volume of regular plant survey." Herriot was a lifelong resident of Galt [now part of Cambridge], where he was employed as a clerk in a machine shop of which the senior partner was a grandson of John Goldie. His botanical activity peaked in the early years of the twentieth century, stimulated by his membership in the Guelph-based

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[45] Specifically, it may be noted that Giffin's sonnet titles included "The Great Divide" and "In the Yellowstone Canyon," but his name is absent from Ewan & Ewan's (1981) thoroughgoing *Rocky Mountain Naturalists.*

Wellington Field Naturalists' Club, during which time he published a number of papers on the plants and birds of Galt and vicinity. In 1906, Herriot accompanied John Macoun on a botanical exploration of the Grand Trunk Pacific Railway [now Canadian National] route from Portage la Prairie, Manitoba, to Edmonton, Alberta. Herriot had, however, begun his private herbarium (now at OAC), which eventually comprised ca. 1500 specimens, somewhat earlier. Of significance in the present study is Herriot's 1892 visit to Strawberry Island (south of Great Cloche Island), notable for its alvars, where among other species he found *Liatris cylindracea* Michx. Herriot exchanged specimens with some other naturalists, including Robert Campbell (supra). (On Herriot, see Kerr, 1931; Groh, 1938; Boivin, 1980.)

Another significant contributor to Canadian floristics was William Copeland McCalla, best known for his extensive collection of Alberta plants. Prior to his move in 1913 to Alberta, where he became a teacher and school librarian, McCalla operated a fruit farm at his native St. Catharines, Ontario. He had studied at Cornell University, according to Porsild (1964), "long enough to come under the lasting influence of Dr. L.H. Bailey and Dr. K.M. Wiegand." His collecting sites in Ontario included the vicinity of Newmarket, which he visited in 1896, and possibly other localities in the Lake Huron basin. (On McCalla, see Porsild, 1964, and Boivin, 1980.)

Edmund Murton Walker (whose father, Sir [Byron] Edmund Walker, was the driving force behind the founding of the Royal Ontario Museums) began plant collecting as a teenager, in the vicinity of his parents' summer home at De Grassi Point on Cook Bay, Lake Simcoe, in 1894, and continued for over 60 years (A.A. Reznicek, pers. comm., 1981, and in epist., 1986). De Grassi Point, as late as Walker's time, was remarkable for its prairie and savannah communities, and had been "the first sandy, flat, dry landing on Lake Simcoe" beyond the Holland Landing area for aboriginal peoples and fur traders travelling north to Georgian Bay. A number of rare and disjunct species are known from this locality (Reznicek, 1983; Reznicek & Maycock, 1984). Walker received his secondary-school education at Harbord Collegiate Institute, while H.B. Spotton (supra) was principal, and his bachelor's degree from the University of Toronto in 1900. After receiving the degree of M.B. in 1903 and doing some graduate study in Germany, Walker joined the faculty of the University of Toronto, where he taught invertebrate zoology and forest entomology and served as head of the Department of Zoology. His scientific publications were largely confined to entomology — he was an authority on the Odonata — but, as noted by Ide (1970), "the breadth of his interests encompassed many other branches of the sciences and other cultural fields." He was one of the founders of the Toronto Field Naturalists' Club in 1920 (Talvila, 1974), and "his wide knowledge of the trees of the forest, shrubs and plants" was greatly appreciated on the field trips that he led for this organization (Ide, 1970).

Alfred Yale Massey does not appear to have done much botanical collecting, but his name is frequently cited because of one specimen, the only record of *Adenocaulon bicolor* Hook., the trail plant, from Ontario (Fernald, 1935; Marquis & Voss, 1981). This specimen was obtained at Cape Croker on the Bruce Peninsula in 1895. Massey, an 1893 graduate of Victoria College, had then just completed a year of high-school teaching at Wiarton. Subsequently, he studied medicine at Trinity Medical College, Toronto, from which he received his M.D. and C.M. degrees in 1898. He spent a year in Labrador with the Royal National Mission to Deep Sea Fishermen (the "Grenfell Mission"), then entered

medical missionary work in Africa. After serving in British Central Africa [now Zambia], he went to the Belgian Congo [now Zaire], where he was appointed Chief Medical Officer for the Belgian Government in Africa. Massey's research on African sleeping sickness was highly regarded, and two arthropod species were named for him (Anonymous, 1922a,b). Unfortunately, he does not appear to have collected botanical specimens after he left Ontario.

Another of these Victorian collectors was James Alexander Porter (1864-1902), who received his B.A. from McGill in 1883 and his M.D. in 1887. During his undergraduate years, he collected some botanical specimens in Québec, which in 1883 were in the McGill University herbarium (Macoun, 1883-1902). After he received his medical degree, Porter, who was originally from Kemptville, became the first physician to practice in Powassan, Ontario, and may have continued to collect botanical specimens. He offered such specimens for exchange, along with birds' eggs and Lepidoptera, in *The Naturalists' Directory* for 1898 (Cassino, 1898) at seq. No specimens collected by Porter in the Powassan area have been encountered in the present study, but possibly some, sent by Porter to correspondents, are now in distant herbaria. (Information on Porter from Stripe & Budreau, 1980, and from records in the Registrar's Office, McGill University.)

A manuscript list of nineteenth-century specimens at TRT from Simcoe County and the vicinity of Lake Simcoe, prepared by Dr. A.A. Reznicek, includes the names of two additional collectors. From 1893 at least until 1897, Charles Trick Currelly obtained botanical specimens at Sparrow Lake, which had become a popular cottage site because of its accessibility by rail at Port Stanton. During these years, Currelly was a student at Victoria College, from which he received his B.A. in 1898 and his M.A. in 1901. He had planned to become a clergyman, but, while he was observing labour conditions in England, his curiosity about an Egyptian artifact he had acquired led to his studying archaeology under Sir Flinders Petrie. After several years of archaeological exploration in Egypt, Syria, and Crete with Petrie and others, Currelly returned to Canada to devote his energies to the development of the newly founded Royal Ontario Museum of Archaeology. As its curator and concurrently as professor of archaeology at the University of Toronto, in which posts he served until 1946, Currelly made major contributions to archaeology and to the philosophy of museums. His objective was that the museum should not be just an assemblage of curios but should illustrate the history of human development, with "the past acting as a guide to the future," stimulating good craftsmanship in Canada (McIlwraith, 1957; L. Dickson, 1986). His Sparrow Lake specimens, however, are evidently his only botanical legacy.

Another private herbarium acquired by TRT was that of Marcella Wilkes of Toronto, who from 1897 to 1916 was a treasurer of the Women's Missionary Society of the Methodist Church in Canada (Anonymous, 1935). Among the earliest specimens from this herbarium, which panegyrically was called "probably one of the finest in Canada," is *Athyrium pycnocarpon* (Spreng.) Tidestr. (present identification) from Atherley on Lake Couchiching, but the majority of the specimens were obtained outside the area and time considered in this paper.

Toward the end of the nineteenth century, some notable botanical collectors from the United States added their efforts to those of Ontario's resident naturalists. Charles Keene Dodge was an 1870 graduate of the University of Michigan, where he had studied botany under Alexander Winchell. He

lived in Port Huron, Michigan, from 1875 to 1889 and from 1891 until his death in 1918, where he was first a practicing lawyer and later a deputy collector of customs (Voss, 1978). Travelling largely by bicycle, Dodge collected large numbers of botanical specimens from both sides of the St. Clair River, and in 1898 completed his "Flora of St. Clair County, Michigan, and the western part of Lambton County, Ontario" (Dodge, 1900), in which he listed 1112 plant species occurring in St. Clair County, presumably not counting those known from Lambton County only. Localities in Michigan were given for the less abundant species; Ontario localities were less often mentioned. This flora and Dodge's herbarium labels do indicate that he botanized at Sarnia and points northeast along the shore of Lake Huron, including Blackwell (ca. 6 km northeast of Sarnia) and Kettle Point. Dodge's activities after the turn of the century included further significant contributions to Ontario floristics. One of these was a flora of Lambton County in its entirety (Dodge, 1915), which incorporated records of plants collected (after 1900) by Newton Tripp (1847-1936), a banker and conveyancer in Forest, Ontario; another was a flora of Point Pelee and vicinity. As noted by Voss (1978), Dodge "was particularly obsessed with citing his home town almost every time he used his name," with the result that many of his specimens obtained elsewhere have been incorrectly attributed to Port Huron. (Several biographical sources on Dodge have been cited by Voss, 1978.)

Among the taxa that Dodge cited only from Ontario, at least twelve were reported on the basis of collections by Thomas Coulson Wheatley, whom Dodge described as "an enthusiastic and careful botanist, who [had given him] much help in looking up the plants of [Lambton County]." Many other species reported from both Ontario and Michigan were attributed to Lambton County on Wheatley's authority. Wheatley was a fruit grower (with additional business interests in his later years) at Blackwell. He was listed in *The Naturalists' Directory* for 1898 (Cassino, 1898) et seq. as a collector of botanical specimens and presumably had a large herbarium of his own, but this does not appear to be extant. Only specimens that he gave to Dodge have been seen in this study. (On Wheatley, see Anonymous, 1906, 1925, and Phelps, 1980.)

Another botanical collector from the United States was Gerritt Smith Miller, who became Curator of Mammals at the Smithsonian Institution. Miller, although known primarily as a mammalogist, also engaged in botanical research during the earlier part of his career, and was especially interested in *Nuphar* (then known as *Nymphaea*), on which he co-authored a taxonomic monograph with Paul Carpenter Standley. In 1896, Miller, who was at that time a recent graduate in zoology from Harvard University, employed by the Biological Survey of the United States Department of Agriculture, spent some time north of the Great Lakes studying the fauna and, incidentally, collecting some plant specimens. During the period from 7 August to 8 September, Miller was in the vicinity of North Bay. Most of this time was spent ca. 8 km north of North Bay, where he found "a great variety of [physiographic] features within easy reach" (Miller, 1899). His specimens from this area were particularly significant in view of the paucity of floristic records from the vicinity of North Bay (see Riley, 1983). (On Miller, see Shamel et al., 1954.)

A third collector from the United States during this period was David LeRoy Topping, who obtained a few specimens at Mortimer's Point on Lake Muskoka in 1899. Topping, a native of North Harpersfield, New York, and a former schoolteacher, was an accountant in Washington, D.C., at the time of this Canadian trip. In Washington, he had become acquainted with the pteridologist William R. Maxon, and had accompanied Maxon and other botanists from the

Smithsonian Institution on many field trips. About 1903, Topping accepted a position in the Philippines in the pre-independence civil service, in which he ultimately became Chief Accountant in the Bureau of the Treasury. He remained there until his retirement in 1922, except for service in Vladivostok with the American Red Cross during and/or immediately after the First World War. Topping, who was especially interested in ferns, collected numerous botanical specimens in many parts of the continental United States, the Philippines, and Siberia; on Mt. Kinabalu in British North Borneo [now Sabah, Malaysia]; and finally in Hawaii, where he lived following his retirement (Anonymous, 1939; Degener & Degener, 1968).

Colin Campbell Stewart, Jr., was a native of Owen Sound and received his bachelor's degree from the University of Toronto in 1894. After graduation, he went to Clark University in Worcester, Massachusetts, from which he received his Ph.D. in physiology in 1897, and spent the rest of his distinguished career as a physiologist and educator in the United States. After teaching in the medical schools of Harvard, Columbia, and the University of Pennsylvania, Stewart went to the Dartmouth Medical School in 1904, where he remained for the rest of his life, ultimately occupying an endowed chair and serving for a time as acting dean. He was known during his earlier years at Dartmouth as "intermittently an out-door man, a mountain climber ... [who] helped organize the Dartmouth Outing Club," and "always a keen student of flowering plants" (Gerould, 1945). In his herbarium, which he donated to Dartmouth College, were specimens collected while visiting his family in Owen Sound in the summer of 1900, from localities including Inglis Falls and Kemble.

One of the paratypes of the name *Amelanchier huronensis* Wieg. is *Biltmore Herbarium no. 5664* (GH), from Gravenhurst, Ontario, collected in 1897 (Wiegand, 1920). (*Amelanchier huronensis* is now usually included in *A. sanguinea* (Pursh) DC.) The numerous specimens distributed by the Biltmore Herbarium (on which see Lanjouw & Stafleu, 1954, and McVaugh, 1956, p. 103) lacked the names of the collectors. However, the principal collector of specimens for this herbarium, especially in 1897, was Chauncey Delos Beadle. He was a native of St. Catharines, and his father, Delos White Beadle, a naturalist, nurseryman, and founding editor of *The Canadian Horticulturist*, lived in Ontario all his life (Barnhart, 1965). Therefore, it seems highly probable that the *Amelanchier* and other specimens were obtained by C.D. Beadle on a visit to his native province.

Beadle, after attending the Ontario Agricultural College and Cornell University (B.S. 1889) and working briefly for three companies in the United States, had gone to the newly established Biltmore Estate just south of Asheville, North Carolina, as assistant to the renowned landscape architect Frederick Law Olmstead. Biltmore, which remains one of the most significant and best preserved of Olmstead's accomplishments, was designed as a "working estate," and included a commercial nursery and managed forests as well as magnificent display gardens. To Olmstead, Beadle's "encyclopedic 'tree-sharpness' was a source of wonder and admiration" (Roper, 1973). After Olmstead's work was completed, Beadle remained at Biltmore as supervisor of the estate and the nursery and curator of the herbarium (Anonymous, 1950a).

Under Beadle's direction, the herbarium grew to ca. 100,000 specimens and distributed thousands to many other institutions. As well as being an assiduous collector, Beadle was a student of the southeastern flora and several plant

genera, including *Crataegus, Marshallia,* and *Philadelphus*, in which and other genera he described a number of new taxa between 1898 and 1902, all, however, from the southern United States. A flood in 1916 that destroyed about 75 per cent of the specimens, combined with the death of George Washington Vanderbilt, the founding patron, and declining interest in private natural-history collections brought an end to the herbarium, and the types and other specimens that Beadle had been able to salvage were given to the Smithsonian Institution by Mrs. Vanderbilt. Beadle remained as superintendent of the estate's gardens and established a reputation as a horticulturist, with special interests in roses and azaleas. His contributions to the gardens at Biltmore included a remarkably thorough representation of American azaleas, collected by himself in many regions of the United States, as well as many species in diverse genera rare or previously unknown in American gardens (Anonymous, 1950a; Frohman & Elliot, 1960).

Two Ontario naturalists of the turn of the century probably preserved no botanical specimens but deserve mention because of their publications on trees and shrubs. Jabez Henry Elliott (1873-1942) received his M.B. from the University of Toronto in 1897 and, in what was an unusual move for a well man at the time, became medical superintendent of the Muskoka Cottage Sanatorium for tuberculosis patients, near Gravenhurst. He remained at the Sanatorium until 1907, except for a two-year leave when he visited sanatoria in Europe and participated in an expedition to Nigeria for the study of malaria and filariasis. In 1907, he went to Johns Hopkins University for further study, then established a practice in Toronto as a specialist in tuberculosis. As well as being eminent in this specialty, he was an early advocate of many public-health measures. Other interests included medical history, one of the subjects he taught in the University of Toronto Faculty of Medicine, and natural history, especially trees (Parfitt, 1943). While he was a student in 1895, he began his observations of the trees and shrubs of the Muskoka District. He continued these studies while at Gravenhurst, and in 1905 published an annotated list of the native trees and shrubs of Muskoka (Elliott, 1905). A few species listed, some of which seem unlikely to represent misidentifications, have not otherwise been reported from the Muskoka District, but no specimens by which these reports might be documented are known to exist (annotations by A.A. Reznicek, based on a ms. list of the Muskoka flora by R.E. Whiting & J. Goltz, 1979).

Elliott acknowledged that many of his notes had been made "in conjunction with" William Hawthorne Muldrew (1867-1904). Muldrew, after several years as a public-school teacher near Rice Lake, had studied at the Training Institute for High School Teachers at Owen Sound. Upon graduation, he had become science master at Madoc High School and commenced extramural studies from Queen's University. After a semester on campus, he received his B.A. from Queen's in 1894. He taught briefly in Orillia, then became principal of Gravenhurst High School, where he remained for nine years (Lochhead, 1905).

While at Gravenhurst, Muldrew established on the school grounds "an arboretum, where practically all the trees and shrubs of the district [might] be seen and studied" (Muldrew, 1905). He authored a series of papers on Ontario trees and shrubs, which culminated in his *Sylvan Ontario*, which in its second edition comprised 69 pages of illustrated dichotomous keys followed by notes on the distribution of species, with many references to occurrences in the Muskoka District. By the time this edition was prepared, Muldrew had obtained the degree of Doctor of Pedagogy from the University of Toronto (in 1899) and had become the first dean of the newly founded Macdonald Institute at the

Ontario Agricultural College in Guelph, where he established a Department of Nature Study. His career was terminated by his sudden death from diphtheria during his second year as dean (Lochhead, 1905).

Before concluding, it is appropriate because of their reputations to mention three of Canada's most active naturalists of the 1890s, who visited the Lake Huron watershed during that decade but who probably did not collect botanical specimens at the time. James Fletcher (1852-1908) and William Hague Harrington (1852-1918) spent two days in July, 1892, at Copper Cliff in the Sudbury District (Harrington, 1894a, 1919). (Harrington stayed on for two more days.) Fletcher, who was then Dominion Botanist and Entomologist, was the author of the *Flora Ottawaensis* and other botanical publications and a contributor of many specimens to the herbarium now designated DAO, as well as being a lepidopterist and an authority on insects of importance to agriculture. Harrington, who had been one of the founders of the Ottawa Field-Naturalists' Club in 1879, was primarily interested in entomology, but was also active in botany in his later years. According to Harrington (1909), "Fletcher went largely in the hope of capturing *Erebia discoidalis*," the red-disked alpine, a butterfly that had previously been taken at Copper Cliff although rare that far south and east. They collected 275 insects on that occasion, although *E. discoidalis* Kirby was not among them. However, because of their concentration on insects and the curtailment of their field work by rain, it is unlikely that they collected plants at Copper Cliff. Harrington's (1894) detailed accounts of their activities, including, e.g., visiting their host and touring smelters, made no mention of botanical specimens. Harrington (1894) did, however, record observations of damage attributed to air pollution and acid rain in the vicinity of Sudbury. (On Fletcher, see Anonymous, 1910a; Harrington, 1909; other articles in vol. 22, no. 10 [1909] of *The Ottawa Naturalist*, which is a memorial number to Fletcher; and Cody et al., 1986. On Harrington, see A. Gibson, 1918.)

James Henry Fleming (1872-1940), "the acknowledged dean of Canadian ornithology" (so designated by Taverner, 1941, q.v. for biography), spent considerable time in the Parry Sound and Muskoka districts, based at Emsdale, around the turn of the century. Although his observations of birds (Fleming, 1901-1902) began as early as 1897, the only botanical specimens derived from this field work to have been seen in the present study date from 1902.

L'envoi

Herbert Groh (1938), in his tribute to William Herriot, wrote: "It is fitting that those who have contributed from their obscurity to the sum total of our existing knowledge should share with others, more officially placed, in our grateful recognition of services rendered." It is in this spirit that the present paper has been written. Only a part of our knowledge of the flora of the Lake Huron watershed in Canada was contributed by botanists of the stature of John Richardson and John Macoun; the rest was amassed through numerous small contributions by persons to whom botanical history has hitherto paid minimal attention. Probably there were other collectors who could have been mentioned in this paper. Certainly much of our knowledge of the flora of other parts of Canada has developed through similar small contributions by little-known persons, whose lives and collections likewise deserve attention from botanical historians.

Acknowledgments

As noted in the introduction, herbarium specimens were in many cases my primary sources of information on who had botanized when and where in the Lake Huron region. I am, therefore, grateful for the opportunity to examine specimens at CAN, DAO, F, GH, HNH, MICH, MO, MTMG, OAC, QK, and TRT.

Most of the library research for this paper was done at McMaster University and the Royal Botanical Gardens. The Missouri Botanical Garden library was the source of a number of historic botanical publications. The Archives of Ontario was also an especially valuable source of biographical data.

I am also grateful for the cooperation I received from staff members, mostly in the rare books, special collections, and local history departments, at several other libraries, viz., the public libraries of Hamilton, London, Owen Sound, Powassan, and Sarnia, Ontario, and Asheville, North Carolina; the libraries of the Royal Ontario Museum and the University of Guelph; and several of the libraries at Dartmouth College and the University of Michigan at Ann Arbor.

My appreciation is also hereby expressed to the staff members at the archives and alumni records offices of McGill University, Queen's University, and the University of Toronto, and to the archivists of the United Church of Canada and the Presbyterian Church in Canada.

Thanks are also extended to those persons whose contributions of information by mail ("in epist.") or orally ("pers. comm.") are acknowledged in the text of this paper. These include librarians, curators, relatives of botanical collectors, and fellow botanical historians.

I am especially grateful to Dr. Anton A. Reznicek for a general review of a preliminary version of the manuscript, on which occasion he made many valuable comments and suggestions for its improvement.

Appendix: List of known nineteenth-century botanical collectors in the Canadian basin of Lake Huron, with years of birth and death (if known) and present repositories of specimens

Alexander, Andrew 1832-1914 greatest number, including own herbarium, at HAM; some at CAN, MTMG, TRT

Ami, Henry Marc 1858-1931 greatest number at CAN; some at MTMG

Anderson, James Alexander 1853-1910 small number at MTMG

Anderson, Robert Thomas 1878-1903 greatest number, including own herbarium, at TRT; small numbers at A, CU, F, MIN, and probably elsewhere (possibly none from Lake Huron basin at these herbaria)

Armstrong, Charles William ca. 1870-1950 TRT, US

Austin, Edward Payson probably late 1830s-probably ca. 1903 MICH; a few may be at other herbaria, but, if so, probably none from Ontario

Balkwill, John Arthur ca. 1842-1908 a few at CAN, DAO, MICH, MTMG; probably also at OAC, possibly at A; few specimens collected from Lake Huron basin and perhaps none extant

Beadle, Chauncey Delos 1866-1950 principal repository US; some, including a few from Muskoka District at GH; for many other possible repositories, most of which, however, may lack Canadian specimens, see Lanjouw & Stafleu (1954) under heading "Biltmore Herbarium"

Bell, John 1845-1878 vascular plants: principal repository of Lake Huron collections CCO; some at CAN, TRT; small numbers GH, MTMG; non-vascular plants: CANL, CANM

Bell, Robert 1841-1917 vascular plants: CAN, QK; small numbers at CCO, GH, US; non-vascular plants: CANL, CANM, QK

Bowman, James Henry 1853-1936 OAC; possibly a few at DAO, MTMG; specimens from Lake Huron basin mostly collected with John Dearness, q.v., and bearing Dearness's name

Britton, Nathaniel Lord 1859-1934 NY; numerous other repositories listed by Stafleu & Cowan (1976) may contain none from 1889 Muskoka trip

Brown, Robert ca. 1767-1845 specimens from North America collected with James McNab, q.v., and generally bearing McNab's name

Buchan, John Milne 1841-1885 most specimens probably not extant; a few, probably none from Lake Huron basin, at MTMG

Burgess, Thomas Joseph Workman 1849-1925 greatest numbers at CAN, DAO, MTMG; some (1887-1890 collections) at HAM; smaller numbers at BM, NY, OAC, TRT, UWO

Cameron, Charles James 1819-1901 small number at QK

Campbell, Robert 1835-1921 own herbarium at MTMG; smaller numbers at DUKE, QK; a few at OAC (possibly none from Lake Huron basin at DUKE or OAC)[46]

Clarkson, Frederick Arnold 1874-1963 TRT

Cosens, Absalom 1869-1938 own herbarium at TRT

Currelly, Charles Trick 1876-1957 TRT

Day, David Fisher 1829-1900 BUF

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[46] Lanjouw & Stafleu (1954) listed K among the repositories of specimens collected by this Robert Campbell. According to Jackson (1901), however, the specimens at K were obtained along the MacKenzie River [Northwest Territories] in 1851 – obviously, in view of the date and location, by Robert Campbell (1808-1894), fur trader and explorer, rather than by Robert Campbell (1835-1921), clergyman.

Dearness, John 1852-1954 greatest number (exclusive of fungi), including most of own herbarium, at MTJB; other major repositories DAO, OAC (the latter from Entomological Society herbarium); smaller numbers at CAN, GH, TRT

Dodge, Charles Keene 1844-1918 own herbarium at MICH; other major repositories MIN, US; smaller numbers at A, CAN, CS, CU, E, GH, MO, MSC, NY, TEX, TRT (some may have Michigan specimens only)

Drummond, Thomas 1790-1835 specimens from Franklin's Second Land Expedition collected with John Richardson, q.v.

Fisher, George Lewis 1868-1953 two specimens from Dorset known to be at MIN; for many other repositories, most of which probably have few if any from the Lake Huron basin, see Stewart (1983)

Gibson, John ca. 1852-1876 greatest numbers at CAN, TRT; a few at MTMG; specimens from 1874 expedition collected with John Macoun, q.v., and bearing Macoun's name

Giffin, James Andrew 1862-1949 a few at HAM

Goldie, John 1793-1886 K; a few at OXF, PH (specimens at MTMG from Niagara Falls only)

Gray, James Ezra 1859-1907 small number at MTMG

Herriot, William 1870-1930 own herbarium at OAC; other major repositories CAN, DAO; smaller numbers at CU, GH, L, NY, TRT (some may have no specimens from Lake Huron basin)

Hincks, William 1794-1871 greatest number of Canadian specimens at TRT; a few at CAN, F, GH, MO, QK (specimens in Irish and U.K. herbaria not from Canada)

Hollingworth, Alice (subsequently Webster) 1870-1954 small number at TRT

Jenkins, William Henry 1863-1907 a few at OAC

Kemp, Alexander Ferrie 1822-1884 own herbarium at QK

Lees, Richard 1856-1938 greatest numbers at QK, TRT; a few at OXF (probably none from Lake Huron basin)

Logie, Alexander 1823-1873 few specimens extant, probably none from Lake Huron basin; a few at CAN, MTMG; two at HAM

MacClement, William Thomas 1861-1938 specimens from Lake Huron basin collected with John Dearness, q.v., and generally bearing Dearness's name

Macoun, James Melville 1862-1920 greatest number at CAN; other major repositories F, NY; numerous other herbaria listed by Stafleu & Cowan (1981) (probably few if any have specimens from the Lake Huron basin)

Macoun, John 1831-1920 vascular plants: greatest number at CAN; other major repositories BM, DAO, E, GH, K, MTJB, MTMG, NA, QK; smaller numbers at A, BRU, CU, HHH, HNH, LIV, MO, NY, PH, QPH, TRT, US, and elsewhere; non-vascular plants: greatest numbers at CANL, CANM; other major repositories FH, NY, PH (lichens), QK, S (mosses), YU (liverworts); smaller numbers at DBN (mosses)

Massey, Alfred Yale 1871-1922 one specimen known to be at CAN

McCalla, William Copeland 1872-1962 own herbarium at ALTA; some Ontario specimens at CAN; see Porsild (1964) and Boivin (1980) for additional repositories (these may contain none from the Lake Huron basin)

McNab (a.k.a. Macnab), James 1810-1878 own herbarium at DBN; other repositories of Canadian specimens BM, E, LIV, MO, PH

Miller, Gerritt Smith, Jr. 1869-1956 greatest number at US; probably some at GH

Morton, James Alexander 1848-1932 greatest number, including own herbarium, at UWO; another major repository MSC; smaller numbers at BKL, CAN, DAO, E, F, GH, HAM, HNH, MSC, MTMG, ND, NY, OAC, PH, QFA, QK, TRT, and elsewhere

Muir, John 1838-1914 few Canadian specimens extant, these at MO

Nicol, William 1861-1924 QK

Richardson, John 1787-1865 greatest numbers at BM, E, K, OXF[47]

Roy, Jessie Dalrymple Gregg 1813-1889 vascular plants: small numbers at BUF, CAN, DBH, F, GH, HAM, K,L,LG, MICH, MO, NY, MTMG, QK, TRT, US, YU, and elsewhere; non-vascular plants: greatest number probably at QK; other repositories CANL, CANM, FH, MTMG, NY, OXF, TRTC, and probably also BM, H, UC, and elsewhere; mosses also distributed in sets of exsiccatae by C.F. Austin – sets at BM, FH, G, K, MANCH, NY, PRE, QK, W

Saunders, Sarah Agnes Robinson 1835-1915 DAO; possibly a few at MTMG

Saunders, William Edwin 1861-1943 greatest number at UWO; some at MO and probably elsewhere

Scott, Patrick John 1865-1944 CAN, DAO, MTMG, QK, TRT, UWO

Scott, William 1845-1920 own herbarium at TRT; smaller numbers at CAN, CU, F, GH, MSC, NY, QFA, QUE, UWO

Smith, Charles Merrill 1848-1919 small numbers at MTMG, TRT

Spotton, Henry Byron 1844-1933 few specimens extant; one known to be at TRT

Stewart, Colin Campbell, Jr. 1873-1944 HNH

Todd, Clement Charles ca. 1795-1828 greatest number at K; a few at E, E-GL

Topping, David LeRoy 1861-1939 own herbarium at US; smaller numbers at MASS, MICH, NY, and elsewhere (probably none from Ontario at these herbaria)

Tytler, William 1842-1932 small number at QK

Walker, Edmund Murton 1877-1969 own herbarium at TRT

Walker, Thomas Leonard 1867-1942 greatest number at QK; some at TRT, CANM (possibly none from Lake Huron basin)

Watt, David Allan Poe 1830-1917 own herbarium at MO; another major repository E; some at BM, F, GH, HHH, K, MTMG, NA, and elsewhere (possibly none from Lake Huron basin at some of these herbaria)

Wheatley, Thomas Coulson 1841-1925 most specimens probably not extant; small number at MICH

White, James 1848-1931 greatest number, including own herbarium, at TRT; another major repository OAC (from Entomological Society herbarium); some at BP, CAN, E, GH, HAM, MIN, MT, P, QK, UWO, and elsewhere (possibly none from Lake Huron basin at some of these herbaria)

Wilkes, Marcella 1842-1935 own herbarium at TRT

Willmott, Arthur Brown 1867-1914 HAM

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[47] According to Vegter (1983), additional specimens from Franklin's expeditions are at CGE, DBN, FI, G-DEL, GH, H, LINN, M (lichens), NMW, NY, PH, and SFD. Most of the specimens at these herbaria are probably from regions northwest of the Lake Huron basin.

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[49] An error for Ph.C. (Pharmaceutical Chemist), as noted by J.L. Baillie (ms. notation, Fisher Rare Book Library, University of Toronto).

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INDEX

Underlined numbers refer to pages on which biographical data are given for persons who collected botanical specimens within the geographic area and time covered by this paper. Numbers not underlined refer to pages on which these and other individuals are otherwise mentioned.

Abélard, P. 25
Agassiz, J.L.R. 14
Alexander, A. 32, 40, 49-50, 60, 70
Ami, H.M. 34, 43, 46, 70
Anderson, James 44
Anderson, James Alexander 44, 70
Anderson, James Robert 44
Anderson, R.T. 55-56, 70
Armstrong, C.H. 47
Armstrong, C.W. 47-48, 70
Austin, C.F. 23, 25, 28
Austin, E.P. 15-16, 70
Back, G. 10
Bailey, L.H. 63
Baker, J.G. 25
Balkwill, J.A. 51-52, 55, 70
Banks, J. 7-8
Barnston, J. 29
Bartram, W. 12
Beadle, C.D. 66-67, 70
Beadle, D.W. 66
Bebb, A.E. 36
Bebb, M.S. 15, 24-26, 36, 62
Bell, J. 18, 70
Bell, R. 17-18, 20, 22, 35, 61, 70
Bensley, B.A. 55-56
Bessey, C.E. 61
Best, G.N. 28
Billings, B., Jr. 17
Blanchard, F. 41, 55
Bolander, H.N. 25
Bowman, J.H. 50-52, 70
Brandegee, T.S. 25
Britton, N.L. 45, 70
Brodie, W. 47
Brotherus, V.F. 26
Brown, R. 12-14, 70
Brunet, L.O. 29-30
Buchan, J.M. 14, 30-32, 57, 70
Buchan, J.N.S. 30
Buchan, J.S. 30
Burgess, T.J.W. 14, 25, 32, 39, 41-42, 46, 49, 70
Burns, J. 27
Burrill, T.J. 45-46
Cabot, J.E. 14
Cameron, C.J. 19, 34, 70
Campbell, R. (clergyman) 53, 62, 63, 70
Campbell, R. (fur trader) 70
Clarkson, F.A. 55, 70
Claypole, K.B.T. 45
Clinton, G.W. 45
Colgrove, W.G. 54
Cosens, A. 42, 55-56, 58-59, 70
Coville, F.V. 47
Cowell, J.F. 45-46
Croft, H.H. 15
Currelly, C.T. 64, 70
Curtiss, A.H. 25
Davenport, G.E. 25
Dawson, G.M. 41
Dawson, J.W. 44
Day, D.F. 44-46, 70
Dearness, J. 40, 42, 50-52, 55, 71
Dodge, C.K. 64-65, 71
Douglas, D. 6, 8, 17
Drake, D. 16
Drummond, A.T. 29
Drummond, T. 10-11, 17, 71
Eames, F.J. 34
Eaton, A.A. 60
Eaton, D.C. 25, 37
Eckfeldt, J.W. 28
Elliott, J.H. 67
Ellis, J.B. 26, 50
Emerton, J.H. 25

Evans, A.W. 28
Fassett, N.C. 18
Faxon, C.E. 25, 37
Fergusson, J. 26-27
Fisher, G.L. 56, 71
Fleming, J.H. 68
Fletcher, J. 68
Forbes, F.F. 54
Fothergill, C. 17
Fowler, J. 20, 23, 25, 27, 56-57, 60
Franklin, J. 8-10, 44, 72
Fraser, J. 12
Gay, C.C.F. 45
Gibbs, E.E. 52
Gibson, J. 14, 27-28, 38, 71
Giffin, J.A. 61-62, 71
Glatfelter, N.M. 43
Goldie, J. 9, 12, 17, 62, 71
Grassl, C.O. 18
Gray, A. 29
Gray, James 44
Gray, James Ezra 44, 71, 74
Gray, John Edward 44
Gregg, W. 23
Hall, E. 25
Harrington, W.H. 47, 68
Haynes, C.C. 28
Heller, A.A. 54
Herriot, W. 62-63, 68, 71
Hincks, C.M. 15
Hincks, F. 14
Hincks, W. 14-15, 17, 19, 22, 35, 71
Hollingworth, A. 47-49, 71
Hollingworth, B. 48
Hollingworth, J. 48-49
Hooker, W.J. 8, 11, 12, 14, 17, 21, 22
Houghton, D. 6, 16
Huntsman, A.G. 56
Huxley, T.H. 14
Ivey, T.J. 32, 59
James, E. 16
James, T.P. 24-25, 28
Jenkins, W.H. 52, 71
Jesup, H.G. 55
Jones, M.E. 16
Joor, J.F. 25
Kemp, W.F. 20, 71
Kendall, E.N. 10
Kindberg, N.C. 28-29
Koelz, W.N. 18
Lapham, I.A. 16
Lawson, G. 18-20, 23, 25, 29, 31
Lea, T.G. 16
Lees, R. 57, 71
Leiberg, J.B. 60
Lesquereux, C.L. 24
Logie, A. 31-32, 34, 49, 62, 71
Loring, C.G., Jr. 14
MacClement, W.T. 51-52, 71
Macdonald, Mrs. 55
MacKay, A.H. 48
MacMillan, C. 60
Maclagan, P.W. 6, 17
Macoun, J. 9, 20-24, 26-29, 32, 38, 41-43, 45, 46, 52, 60, 63, 68, 71
Macoun, J.M. 43, 60, 71
Macoun, W.T. 28
Mann, H., Jr. 20-21
Massey, A.Y. 63-64, 71
Masson, F. 7-9
Maxon, W.R. 52, 65
McCalla, W.C. 63, 71
McIlwraith, T. 49
McMorine, J.K. 27
McNab, J. 12-14, 17, 70, 71
McNab, W. 12
Meehan, T. 45-46
Michaux, A. 6
Miller, G.S., Jr. 65, 71
Millman, T.L. 62
Moffat, J.A. 53
Morden, J.A. 53
Morton, J.A. 52-56, 58, 62, 72
Muir, D. 21
Muir, J. 21, 72
Muldrew, W.H. 67-68
Nash, C.W. 47
Nickle, W.F. 57
Nicol, W.B. 57
Nicol, William (of Canada) 56-57, 72

Nicol, William (of Scotland) 57
Nuttall, T. 6
Olmstead, F.L. 66
Parry, W.E. 8-9
Pearson, W.H. 28
Penhallow, D.P. 44
Peters, T.M. 25
Petrie, F. 64
Pitcher, Z. 6
Porter, J.A. 64
Porter, T.C. 25
Pringle, C.G. 60
Provancher, L. 29
Rabenhorst, G.L. 26
Ravenel, H.W. 25
Redfield, J.H. 15
Reinsch, P.F. 26
Richardson, J. 8-11, 17, 68, 72
Riddell, J.L. 6, 16
Robinson, J. 25
Roy, A.K. 26
Roy, J.D.G. 22-27, 36, 37, 41, 62, 72
Roy, W. 22-23
Sagard, G. 7
Sandberg, J.H. 60
Sargent, C.S. 51
Saunders, S.A.R. 41-43, 72
Saunders, W. 43, 51
Saunders, W.E. 42-43, 47, 50-51, 72
Schott, A.C.V. 25
Scott, P.J. 39, 42, 72
Scott, W. 49, 59-60, 72
Scott, W.L. 59
Scudder, S.H. 16
Seeman, B.C. 29
Short, C.W. 16
Smith, C.M. (clergyman) 41
Smith, C.M. (physician) 41-42, 72
Spotton, H.B. 14, 31-32, 57, 59, 63, 72
Spreadborough, W. 28
Stevenson, H.A. 51-52
Stevenson, W.J. 52
Stewart, C.C., Jr. 66, 72
Strachan, J. 17
Sullivant, W.S. 28
Thoreau, H.D. 20-21
Todd, C.C. 11-12, 17, 72
Topping, D.L. 65-66, 72
Traill, C.P.S. 25
Tripp, N. 65
Tuckerman, E. 28-29
Tytler, W. 19, 72
Underwood, L.M. 28
Vanderbilt, G.W. 67
Vasey, G. 25
Walker, B.E. 63
Walker, E.M. 63, 72
Walker, T.L. 57, 61, 72
Watt, D.A.P. 15, 25, 29-30, 72
Wheatley, T.C. 65, 72
Wheeler, C.F. 60
White, J.E. 60
White, J.F. 60
White, J.H. 60
White, James (of Ottawa) 60
White, James (of Snelgrove) 49, 52, 57, 60-61, 72
White, Mrs. J.S. 60
Wiegand, K.M. 63
Wilkes, H. 64, 72
Willmott, A.B. 61-62, 72
Wilson, W. 26-27
Winchell, A. 64

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